Material Handling Engineering

DECEMBER 1958

BELT CONVEYORS

The first in a series of comprehensive studies on selection and use of all types of conveyors-

see page 6

ALSO IN THIS ISSUE:

SLIDER BED

Selecting Corrugated
Containers page 82

Moving Workers to page 72 the job or LP Gas?

Complete contents on page 3

N INDUSTRIAL PUBLISHING COMPORATION MAGAZINE

OVERALL LENGTH (Minimum 70)

IVE SECTION #7358 . INTERMEDIATE SECTIONS #7299 AS REQU

The original publication of the moverial handling inters

dustry, preferred by identified buyers of material han-

Support dling, packaging and shipping equipment and supplies.

MATERIALS HANDLING MADE EASY

NOELTING

Faultless Casters

Give you many <u>new</u> ways to cut your handling costs



These five Faultless Caster installations are examples of the versatility and broad scope of the Faultless line. Whether you want to move 50 pounds of delicate instruments or 15 tons of sheet steel, Faultless—the "Complete Line" backed by nearly three quarters of a century of caster-making experience—assures you the right casters to best do the job.





STORAGE-ASSEMBLY LINE TRUCKS Series 400 Casters are us

Series 400 Casters are used on one standardized truck which accommodates all sizes of luggage through storage and assembly stages.







WORK SCAFFOLDS
Series C900 Caster with dual acting brake which locks both swivel and wheel action—combines stability, mobility and safety for work scaffolds.





V-GROOVED TRACK ASSEMBLY LINE Series 600 Caster with V-grooved wheel eliminates ten handling operations in production assembly of refrigerator and freezer doors.

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Your nearby Faultless Industrial Distributor maintains a substantial inventory of Faultless Casters for immediate delivery. He and one of the strategically located Faultless Sales Engineers are avail-

able to work with you on every handling problem in your plant. Both are listed in the phone book Yellow Pages, under "Casters," beneath the Faultless heading.

Write for FREE Condensed 20 PAGE CASTER CATALOG



Faultless Caster Corporation

Evansville 7, Indiana

Send Free copy of 20 page Caster Catalog, 157-G

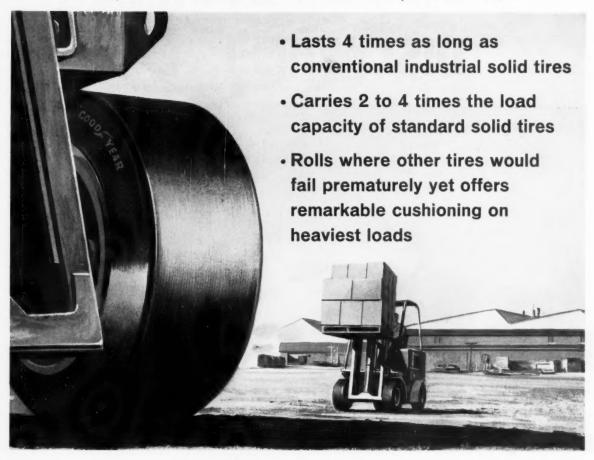
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WEARS LIKE STEEL. Shrugs off

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INDUSTRIAL TIRES

Neothane - T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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The Mark of Leadership



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Only DISOWHEEL uses a tire made of a new synthetic material—DISOGRIN®—a special polyurethane elastomer "strong as steel, resilient as rubber". DISOWHEEL tire outlasts rubber and most synthet-

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reader's guide to



for December 1958

COVER: In this issue MHE's editors present the first in an extensive series of articles about the selection and use of conveyors. The blueprint cover design reveals that this first article is concerned with belt conveyors. In forthcoming articles every type of conveyor in use by Industry will be discussed.

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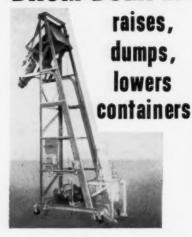
PACKAGING/SHIPPING -

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- 82 SELECTING CORRUGATED CONTAINERS
 - Things you ought to know about a widely used material with an even brighter future.
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 - Step-by-step case history of a corrugated container.
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 The year's best packages as displayed at the Chicago show.



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G-W PORTABLE DRUM DUMPER



... only 2 buttons to push!

Unloading full drums, barrels, or containers is easy with this simple rugged machine. Move it almost anywhere on its sturdy rubber casters. Then push the UP button to raise and empty a drum over a high vat edge; press DOWN button to return the carriage for a fresh load.

G-W Drum Dumpers can be "tailored" to meet your weight requirements. Specially designed carriages will handle any size and type of

Fully Automatic drum handling systems are one of G-W's materials handling specialties. Engineered for the needs of large or small plants, these systems can handle 30 to 40 containers an hour-through loading, unloading, washing and storage.

Mail the coupon below for your free copy of G-W's Idea Book on Materials Handling, plus details on modern drum handling methods.

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MATERIAL HANDLING Engineering

volume 14 number 3

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published monthly by

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the manufacturers of material handling, packaging and shipping equipment will have the floor. They will tell you about their latest developments in equipment and supplies. To make it more useful to you, the issue will be divided into 10 sections. Watch for it . . . MHE's Annual New **Products Review**

LICALI I TL-S° JACKSTACKERS°

Stack Faster, Smoother, Safer . . . Give you exact inching & spotting!

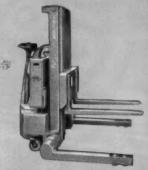
The One COMPLETE Line of High Lift Walkies — 4 Basic Models



Capacities up to 6000 lbs Lifting heights to 124".



A narrow aisle (6" or less)
"Walkie" truck, Bostally
designed to "straddle" and
stack Single Wing Pollets.
Can also be used with all
other pallet types and Skid
Platforms.



2 OPEN FACE PALLET*

Capacities up to 6000 lbs. Lifting heights to 125".



Another L-S narrow aisle
"Walkie". Designed for all
types of Single Face Pallets. Use also with other
pallet types except Doubleface. Handles Skid Platforms easily.



3. PLATFORM TYPE*

Capacities up to 6000 lbs. Lifting heights to 129".



Here's still another L-S
"Walkie" designed for narrow aisle operation. Use it where a Built-in Platfors is desired or where Skid Platforms are to be stacked.



4 COUNTERBALANCED

Capacities up to 3000 lbs

An all-purpose juniar fork lift truck. Handlet all types of pallets and Skid Platforms. Ideal for loading and unloading trucks and box cars. Has forward and reverse must tilling. Good for grades and ideal for modium and short hauls.



All L-S Jackstackers have exclusive ROTO-CAM Handle—giving you finger-tip control for forward, reverse, two braking systems, lifting, lowering (plus till for Counterbalanced Type).



* Extra capacities available for low fork elevations up to 15,000 lbs Higher lifts for lighter loads up to 200"



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The MASTER Line — The COMPLETE line of Materials Handling Equipment

LEWIS-SHEPARD, 1312 Walnut Street, Waterfown 72, Massachusetts

Gentlemen: Please send me your JACKSTACKER Catalog 34-1

Please send me your Roto-Cam Control Handle Circular 34-H

Please have an L-S representative call

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CITY ZONE STATE





Will New "Perimeter Supply" Ideas Improve Your Next Industrial Plant Layout?

Rapistan[®] Flow Rack[™] Methods Upset Old Concepts Of Supplying Work Areas

You've heard of storage "at the point of use"? Perhaps you've even applied it in the usual way — by stacking materials next to the worker. It still means that your lift truck or floor truck must enter the work area, disturb the schedule, clutter up the area, create personal injury hazards and invite conversation.

Today's new approach to this storage at the point of use is "Perimeter Supply," made possible now by creative use of Rapistan live-storage Flow Racks surround-

ing a work area.

This method will change thinking on plant layout. Why? It pays off handsomely in work area space savings, and improved production through smoother materials handling. We've proved this — right in our own plant! Our plant engineers recommend this new method to their contemporaries.

Can you see how "perimeter supply" can give you the benefits described in the next paragraphs?

Less Time, More Movement

Perimeter Supply accomplishes the industrial engineer's objective of bringing the work to the worker at his work station. Only assigned workers enter a work area when



SUPPLIES ARE DELIVERED without disturbing operations inside the work area. Here tote pans are loaded into a Flow Rack from the perimeter service aisle. Lift truck transfer attachment lines up with Flow Rack storage hatches to speed loading.



WORKERS HAVE A CONSTANT SUPPLY of all needed materials near at hand, in the Flow Rack live storage racks which bound this department. Racks are supplied from service aisles outside the area. Gravity force moves the supplies through the rack to the workers. Stock men need not enter the area.

Flow Racks surround it in a "perimeter supply" pattern. Undisturbed work is efficient work.

Better Operations Control

Inventory control is at its best when perimeter supply is used with Flow Racks. Storage is properly organized, orderly and efficient. Stock rotation is always first-infirst-out. There is continuous control of inventory level, since the supply on hand can quickly be checked at a glance. Material for a day's run is ready at arm's length.

Improved Labor Efficiency

Perimeter Supply separates materials handling from other labor. When a man no longer must take time to hunt for materials, he has more time to spend at his production job. Output per man-hour increases by fencing out distractions and conversationalists.

Longer Production Runs

Flow Rack uses all the available cube area, when applied in a "perimeter supply" pattern. It increases the storage capacity at point of use, puts more on less floor. Consequently, it's possible to get more

production efficiency by setting up longer production runs of components and sub-assemblies. This means savings in set-up time, and other benefits coming from higher volume production.

More Profitable Use of Space

Space is measured by the dollar as well as by the square foot. When work areas are perimeter-supplied, the need for aisle space within the area is eliminated. Production areas can be more compact — more efficient. Productivity per square foot of plant space goes up, and plant profits follow accordingly. That's what materials handling engineering management is paid to accomplish.

Your local Rapistan representative knows all this, and can help you gain these layout benefits in your own plant. It takes minimum investment in conveying equipment. Let us send you an interesting case study of space and labor savings through improved materials handling with Flow Rack ideas. Please circle No. 10 on the Reader Service Card.

The King Pin is Gone - Long Lives the New Rapistan Caster!

In its day, a king pin was fine for single ball raceway casters. But it's definitely "old hat" now. Rapistan's new 3100 Series

caster eliminates the errant king pin, and gives you far longer caster life and much easier swiveling action.

Instead of using a king pin in the new Rapistan 3100 Series Caster, the top plate and yoke are joined by a ball bearing raceway. How does this result in longer caster life and easier swiveling? Read on.

1. The principal point of premature failure in most casters, the king pin, is entirely

eliminated.

2. Shocks and stresses are distributed evenly over a hardened ball bearing, not concentrated on a king pin and a limited area of the bearing. This minimizes ball bearing indentation and prevents uneven wear on the raceway.

3. The bearing provides snugfitting, all-around rolling contact between the top



plate, bearings and yoke. It eliminates binding friction at the king pin, making this 3100 Series the easiest-swiveling caster ever designed.

For literature on this remarkable new development in caster design, Circle No. 11 on the Reader Service Card.

"Air Pockets" In Your Plant? Rapistan Overhead Conveyor Fills Them For Better Handling



Rapistan-Keystone overhead trolley conveyor proves many times to be the most efficient means of moving parts through processing operations, and a space-saving method of warehousing finished goods in many applications. With its exclusive "high-payload" forged steel trolleys and patented design rivetless chain, Rapistan-Keystone equipment stands up under punishing applications like these far better than any other light-medium duty overhead conveyor. This is not overstatement - it's fact!

Here are two typical examples of R-K. overhead conveyors used for movement and storage. A 'big three' automobile manufacturer (top) uses Rapistan overhead conveyor to move engine pistons through successive plating and rinsing baths. Bulky finished parts are stored efficiently on Rapistan-Keystone overhead conveyor (bottom) above the order accumulation area of this plant. For details, Circle No. 12 on the Reader Service Card.

Cost Reduction Through Technics

By Joseph A. Sedlak, Consultant

I am a staunch supporter of the "Technics approach" to materials handling. All too often.



materials handling is not pro-

viding as great a return on investment as expected.

"Technics" is a program dedicated to the fullest possible utilization of equipment. This "utilization factor" of new and present equipment can be increased by a program of study, analysis and coordination of the many departments of a business that are affected by materials handling.

For example . . . one of the very large dress manufacturers installed a fine conveyor system for final packing and shipping. By applying the "Technics approach" to the problem, beyond the materials handling operation, they made an additional saving of \$6,500 a

"Technics" recognizes materials handling as a catalyst within the company that can bring about far reaching cost reductions.

"However, materials handling must be approached on an overall company basis. It reaches from supplier to customer. It is not fully effective when approached on an isolated or piece-meal basis."

Send For This Handbook Of Money-Saving Ideas



You'll have a close-up view of more than 70 actual handling problems solved, as you leaf through this new handbook of materials handling ideas. See how the coordinated use of many Rapistan conveyors is

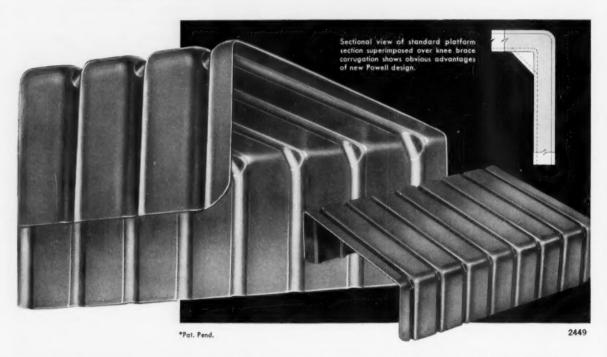
compounding savings in time, space and manpower through better materials handling. Circle No. 13 on the Reader Service Card.



materials handling systems The RAPIDS-STANDARD CO., Inc. 340 Rapistan Bldg., Grand Rapids 2, Mich.

SKID PLATFORM* ...BY POWELL

exclusive formed-in knee brace means extra strength, longer platform life_at no extra cost!



A new forming concept developed by Powell engineers—a unique integral knee brace that is formed into each corrugation—eliminates common weakness of ordinary platforms—add years of service life to steel platforms at no extra cost!

PROOF—In competitive tests, made by a large automotive manufacturer, three platforms were put under the same stress load. "'A' and 'B' platforms both cracked immediately, but the new Powell platform* withstood bending in both directions, and without a sign of cracking. Microscopic examination proved the new platform to have minimum embrittlement while the other two platforms

had been severely cold worked in forming, resulting in a high degree of embrittlement."

That's the story! The exclusive formed-in knee brace enables Powell to build a stronger platform without excess cold working. It means there's a knee brace at every corrugation with no dangerous embrittlement at the bends. It means platforms can absorb much greater shock abuse without failure; maintenance and replacement costs are reduced. Why not stretch your materials handling dollar with Powell knee brace platforms—they cost no more than standard units. Call the Powell distributor nearest you, or write for further information direct to Powell Pressed Steel Co., Hubbard, Ohio.

Another new idea from



THE NATION'S FIRST NAME IN ALL STEEL MATERIAL HANDLING CONTAINERS

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MATERIAL HANDLING ENGINEERING



for plant lifting jobs

• A UNIT Mobile Crane is just what you need for the many material handling jobs around your plant. Mounted on rubber and self-propelled, the machine travels anywhere and works efficiently, even in small yards where space is limited. Easy hydraulic steering and operating controls from within the FULL VISION CAB give the operator complete visibility for SAFE loading and unloading. For faster material handling and lower operating costs, investigate these Mobile UNITS.

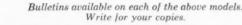


UNIT 357 MOBILE CRANE - powered by one engine — controlled and operated by one man — short turning radius — air operated transmission — hydraulic steering — mounted on six pneumatic tires, duals on rear capacity 10 tons.

UNIT 15201 designed for heavy duty truck crane operation. Lifting capacity up to 20 tons. Also avail-able is a UNIT 1014 TRUCK CRANE having a lifting capacity of 15 tons at a 10 foot radius.

UNIT 1520 Heavy-Duty Mobile Crane with lifting capacity up to 20 tons. Mounted on twelve pneumatic tires with duals on steering axle and tandem





UNIT CRANE & SHOVEL CORP. 6531 W. Burnham Street • Milwaukee 14 Wisconsin











A7-5011



The new MOTOROLA DISPATCHER radiophone with TRANSISTORIZED CIRCUITS gives you:

- * Smallest Mobile 2-Way Radio Ever Developed . . transistors and printed circuits help engineer radio down to fit conveniently on any vehicle.
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- Transistorized Power Supplies . . . designed to operate from 6, 12, 24 volts DC and up. plus 117 volts AC. No converters or battery tapping. Fully transistorized voltage regulation.
- Highest Speaker Volume . . . an operator away from his vehicle can hear messages even in noisy areas — every word is sharp and clear.
- Rugged, Reliable . . . long-life transistors, printed circuits, rubber cushioned mounting
 — everything designed to withstand jars, jolts and vibration.

Here's the mobile radio that's truly tailored to speed your materials handling. This rugged radio is easy to mount, requires only a trickle of current, and can be heard in the noisiest areas. No matter what kind of industrial vehicle you have — gasoline, LP gas, diesel or electric powered — there's a Motorola DISPATCHER radio for you. Models for electric vehicles feature transistorized voltage regulation to guard against varying voltages.

Now your materials handling supervisor can have full control as he "rides with the driver" of each vehicle. Get all the information and you'll see why an investment in radio soon pays for itself in the time it saves.

WRITE FOR FOLDER



Self-contained model — for use where dashboard space is avail-

Separate speaker model, for rear or remote location of chassis, with front-mounting of speaker and microphone.



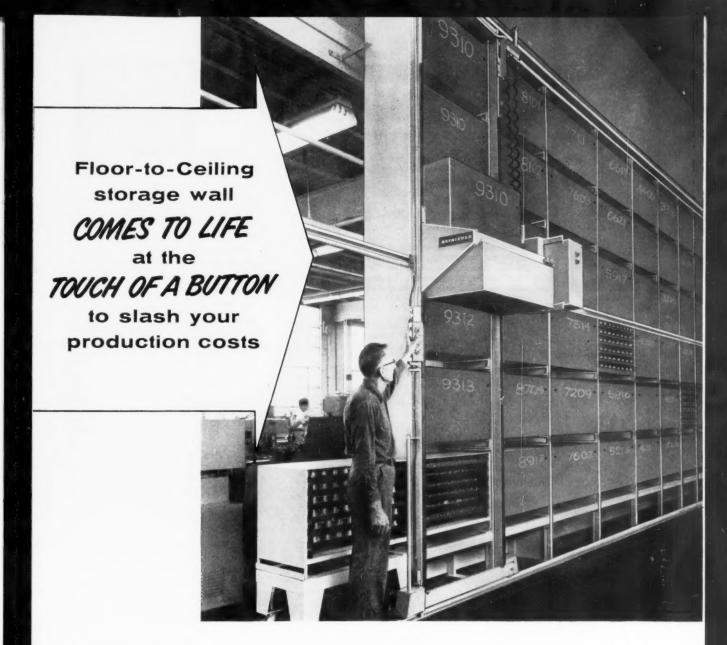
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THE RETRIEVER, transforming a revolutionary new concept in materials storage into practical reality, puts all your space to work, right up to the ceiling... with 4 times more cubic feet of storage per square foot of aisle and rack area. Aisles become clean and safe as THE RETRIEVER packs clutter away for good. Manpower costs go down with push button stacking of loads up to 4,000 pounds in

each spacious, protected storage compartment . . . for delivery at the touch of selective electrical controls. Loads can be delivered to THE RETRIEVER via any conventional handling equipment, and stored on skids or pallets, in bins or trays. Dimensions can be tailored to any needs. And you'll be surprised at the low cost of THE RETRIEVER . . . particularly in terms of the dollars it saves.

YOU SAVE

SPACE • MANPOWER

DAMAGE LOSSES

DOWN-TIME

SET-UP COST

... A Wall Instead of an Addition

... An Aisle Instead of a Mess

Inquiries welcomed

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. . . for complete facts, call or write

CLEVELAND 21, OHIO

VERGREEN 2-2300

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[ENNANT] Industry's most complete

line of POWER SWEEPERS



HERE IS America's most complete and widely used line of power sweepers . . . for plants of all sizes.

If your plant is not already using a TENNANT Sweeper, you'll be surprised at its performance . . . and the savings it can bring you.

FOR CONGESTED AREAS - A compact NEW walkbehind Sweeper (Model 40). Cleans 32" path, turns in its own tracks. Equals "big sweeper" performance for CLEAN sweeping! Sweeps 8 to 20,000 sq. ft. per hour in most plants . . . or 2 to 5 times faster than a man with a broom. Very powerful brush-and-vacuum system: out-performs any other sweeper of its size for clean, dust-free work.

FOR SMALL PLANTS - Versatile space-saving Sweeper (Model 50) cleans 40" path on the run. Travels at 1½ to 8 mph, sweeping 3 to 7 times faster than is possible by hand. Rider-type; easy to use. Combined brush and vacuum system instantly removes chips, sand, debris, dirt and dust that pushbrooms can't pick up.

Compact design and easy steering make the "50" ideal for both congested and open areas. Often pays for itself in 9 to 14 months. Gas or LP-gas models.





FOR HEAVY DUTY SWEEPING—The superbly engineered Model 80 is industry's choice for rugged, 'round-the-clock sweeping. Has no equal for performance. Cleans 53" path. Sweeps up to 110,000 sq. ft. per hour in open areas, yet is "aisle-designed" to operate efficiently in aisles as narrow

Easy to operate: starts, stops, reverses instantly. Dirt hopper holds up to 800 lbs., dumps hydraulically in 10 seconds. Gas or LP-gas models; similar electric powered model available.

FOR MAXIMUM CAPACITY, here is the giant Model 100. Has 3 to 4 times the capacity of smaller sweepers. Cleans 7' 4" path, yet has turning radius of only 9' 2". Hydraulic dump hopper holds almost 2 yards.

Excellent dust control and huge capacity make it ideal for yards, docks, salvage work, large aisles, etc. Nothing else like it!

Write today for illustrated bulletins on Tennant Power Sweepers. Get details on how to reduce your sweeping costs.



Sweeper

G. H. TENNANT COMPANY, 707P N. Lilac Drive, Minneapolis 22, Minnesota

SPECIALIZED MAINTENANCE EQUIPMENT

POWER SWEEPERS . FLOOR MACHINES . SCARIFIERS . ROOF SCRAPERS . CONCRETE ROUTERS Circle No. 105 on Reader Service Card for more information

The Low-Down on Education:

Kindly forward at your earliest convenience, information on the below listed courses as outlined in the October 1958 issue of MATERI-AL HANDLING ENGINEERING. Please indicate the time schedule and describe the content of each course. Additional information that may be available will be appreciated.

Material Handling, Columbia University, New York

Material Handling, Lincoln Extension Institute, Cleveland

Industrial Plant Planning, New York City Community City College, New York

Material Handling and Warehousing, Traffic Managers' Institute, New York.

Thank you for your cooperation.

Harold E. Campbell Long Island Lighting Co. Hicksville. N. Y.

Sorry, we don't have all that information. But we're happy to send Reader Campbell, as we have for many others, the name of the person he should write to for more information at each of these colleges.

Who Makes Packaging Machines?

SIR:

We are interested in learning the names and addresses of manufacturers of the following types of machinery:

- 1) Machinery for making shipping bags of lightweight corrugated or equivalent.
- 2) Machinery for making corrugated liners and fillers for shipping cartons.
- 3) Machinery for making liners and fillers for other materials such as creped cellulose wadding.
- 4) Machinery for making corrugated cartons.
- 5) Shredding machines and corrugated cutting machines.

Your being publishers of a

New...MORE POWER

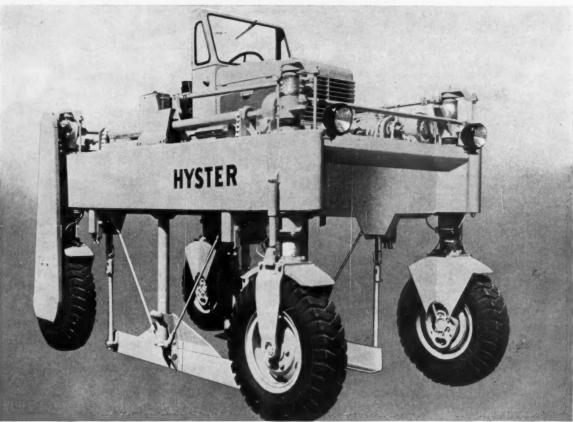


Photo shows all-weather can removed. Chain quards are entional at extra cost

HYSTER STRADDLE TRUCK® CARRIER

Entirely New — Model M300E — 30,000 lb. Carrying Capacity

MORE POWERFUL ENGINE

Chrysler V8 industrial engine gives power to spare for acceleration, grade climbing and long hauls.

BETTER RIDE

New spring suspension and shock absorbers provide smoother ride for load and driver over any terrain.

EASIER STEERING

Power Steering takes over for easy control in maneuvering at slow speeds. Helps speed up operation.

HEAVY-DUTY POWER TRAIN

Rugged four-speed synchromesh transmission, propeller shaft, differential, axles and drive chains for dependability and long service life.

ROOMY DRIVER COMPARTMENT

Driver safety and convenience is featured in the new control arrangement and cab design.

LONG LIFE CONSTRUCTION

Main frame is of simplified yet rigid design, greatly improving work-life potential of truck.



Write Hyster Company, Box 847, Danville, Illinois, for free folder describing the new M300E. Ask your dealer for a demonstration.

HYSTER®



MOVING AHEAD WITH INDUSTRY

FACTORIES: Danville, III. • Portland, Ore. • Peerla, III. • Kewanne, III. • Glasgow, Scotland • Niimegen. The Netherlands • Soo Paulo, Brazil • Sydney, Australia (licensee)

Circle No. 48 on Reader Service Card for more information

PLANNED STORAGE

.. AVOIDS WASTED TIME, WASTED SPACE IN TOOL AND PARTS STOREROOMS

Fewer steps, shorter waits, because all items are close . . . within easy reach, without climbing.



Frequently needed small items at your fingertips with Rotabin Counter Unit.

Here's how to cut factory costs by cutting waiting time of machinists and other expensive help at the tool-room service counter . . . decrease downtime of machines while operators wait for tools.

Servicing time can be cut in half, tool crib capacity can be doubled with expertly planned use of F-G-M Rotabins and

other Bonderized Steel Shelving. F-G-M Storage Planning by experienced Storage Engineers is a Frick-Gallagher Service that's yours for the asking.



Write for catalog "The Science of Economical Shelf Storage."





Circle No. 44 on Reader Service Card for more information

LETTERS TO THE EDITOR

Continued

magazine catering to the packaging industry prompts our writing to ask if you could furnish us with this information.

> E. J. Van Huisseling Comptometer Corp. Chicago, Ill.

Gladly. Names and addresses of 27 manufacturers have been sent.

Likes Our New Name:

SIR:

Have just read about the name change from FLOW to MATERIAL HANDLING ENGINEERING.

Think it is an excellent idea. FLOW stopped identifying your good book almost five years ago.

John Farley Marshall-Farley Associates, Inc. New York, N. Y.

SIR:

Just finished reading your new (old) FLow.

Wish to congratulate your organization for a very fine job. Like the idea of the new title and would comment that I find your magazine very educational, helpful, and enlightening.

Frank B. Dahlinger Region II Vice President, AMHS Raybestos-Manhattan, Inc. Passaic, N. J.

FLOW Directory Still Available

To FLOW:

We are interested in receiving a new FLow Directory of material handling equipment.

Is it possible for you to send us a copy for our files?

Harold H. Cohen Cohen Industrial Supply, Inc. Erie, Pennsylvania

Copies of the 1958/59 Flow Directory are still available. Like the material handling industry it serves, the Directory is bigger than ever before—contains even more useful information than past editions. Price is \$7.50 a copy.

REDUCE YOUR WASTE DISPOSAL COSTS

With These Low-Investment Systems



THE DEMPSTER-DUMPSTER



THE DEMPSTER-DUMPMASTER



THE DEMPSTER COMPACTION TRAILER



THE DEMPSTER-DINOSAUR

America's Most Complete Line of Waste Disposal Systems

The big savings in waste disposal are made with mechanized, containerized, collection equipment. Dempster Brothers, the pioneer manufacturer of containerization equipment, now offers four efficient systems to help you increase your efficiency and decrease costs.

The DEMPSTER-DUMPSTER handles containers up to 15 cu. yds. The DEMPSTER-DUMPMASTER, available in three sizes, picks up and empties containers from one through six cu. yd. capacity. Compaction bodies are 18, 24 and 30 cubic yards with capacities up to 120 cubic yards of loose refuse. The DEMPSTER Compaction Trailer will hold and haul over 200 cubic yards of loose material per trip and it can be loaded by the DEMPSTER-DUMPSTER GRD-304-F-2. The DEMPSTER-DINOSAUR offers giant containers up to 40 cu. yds. and over.

Write today for complete information.

Mfd. By DEMPSTER BROTHERS the originator and only

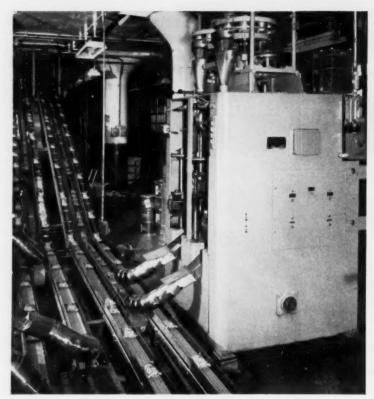
manufacturer of the DEMPSTER-DUMPSTER Systems

Knoxville 17, Tennessee



DEMPSTER BROTHERS

Circle No. 30 on Reader Service Card for more information



Why General Mills chose Robo-Wrap for Pick-A-Pack

This new Robo-Wrap at General Mills' Chicago plant will soon be joined by 2 more machines—because it has been proved that Robo-Wrap increases the efficiency and economy of their packaging operation. The Robo-Wrap forms, fills and seals pillow packages. Under production line conditions at General Mills, the Robo-Wrap cruises at 100 bags a minute and can run at 120 . . . it provides a better seal and fewer rejects even at these high speeds because its unique hand-overhand action holds jaws in sealing position for a longer time . . . it minimized work stoppages due to torn paper roll stock because the combination mechanical and hydraulic jaws exert a strong, jerk-free pull . . . it is easily adaptable to handle a variety of other products.

Robo-Wrap packages in cellophane, paper, poly, plastic or laminates. See how it can answer your needs for speed, dependability, easy maintenance and adaptability.

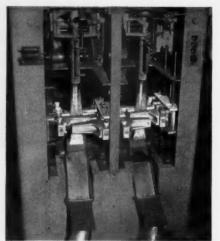
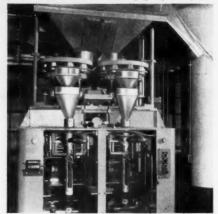


Photo shows hand-over-hand sealing action. Lower jaws, now disengaged, start to go up and pass on the outside of still-engaged pair of jaws.



Robo-Wrap versatility permits many different feeding arrangements. At General Mills, there is a volumetric feeder leading from storage hopper supplied from floor above.



General Mills Pick-A-Pack Package offers five tasty breakfast foods—Wheaties, Cheerios, Kix, Trix, and Sugar Jets—in one attractive carton.



Write for Illustrated Robo-Wrap Folder that demonstrates features and advantages important to you.



ONE TRUCK...DOUBLE DUTY



NEW YALE TRIPLEX MAST FEATURES HIGH LIFT, LOW-HEADROOM CLEARANCE

for fast, continuous handling operations

216"-HIGH REACH-96"-LOW SILHOUETTE

Boost storage capacity of present warehouse! Tier loads high as 216"! With mast up, take full advantage of air rights. With mast down, move safely into freightcars or trailer trucks—into any low-headroom area. Result: smooth, continuous flow of materials in and out of your storage, production and shipping areas.

New Yale Triplex Masts offer outstanding features – new interlocking I-beam construc-

tion for greater load stability—new open-front design that gives the driver full forward visibility. Adaptable for both Gasoline and Electric trucks. Capacities: 3,000, 4,000 and 5,000 lbs.

Max. Fork Lift	108"	126"	144"	162"	180"	201"	216"
Collapsed Overall Height	59"	65"	71"	77"	83"	90"	96"

For full facts, write The Yale & Towne Mfg. Co., Philadelphia 15, Pa. Dept. A-412.

YALE*

INDUSTRIAL LIFT TRUCKS & TRACTOR SHOVELS · HOISTS

YALE & TOWNE

GASOLINE, ELECTRIC, DIESEL & LP-GAS INDUSTRIAL LIFT TRUCKS . WORKSAVERS
WAREHOUSERS . HAND TRUCKS . INDUSTRIAL TRACTOR SHOVELS . HAND AND ELECTRIC HOISTS

YALE MATERIALS HANDLING DIVISION. THE YALE & TOWNE MANUFACTURING CO. MANUFACTURING PLANTS: PHILADELPHIA, PA.; SAN LEANDRO, CALIF.; FORREST CITY. ARK.

Circle No. 113 on Reader Service Card for more information



THIS IS UNNECESSARY WASTE...

MONARCH SOLIDS and reduce replacement costs!

This was a lift truck tire. Its delivered cost was about \$55.00. It was one of four that failed prematurely.

The buyer, who had assumed "all solids are alike", now has a replacement tire expense of approximately \$220.00 for a single truck. And his management is asking embarrassing questions!

Selective purchasing could have reduced this maintenance cost. That is why more and more savingsconscious users . . . after comparative performance tests . . . have switched to MONARCH industrial solid tires. Made from the toughest natural rubber tire stock developed to date, MONARCH solids give more ton-miles per dollar invested.

FOR DETAILS AND SPECIFICA-TIONS, ask your Monarch dealer . . . or write direct ... for Catalog MR-457.



210 LINCOLN PARK . HARTVILLE, OHIO

7-225 General Motors Bldg., Detroit, Mich.
2353 No. California Ave., Chicago, III.
Warehouse: Reno, Nevada



Circle No. 77 on Reader Service Card for more information

STEPHENS-ADAMSON WELDED ALL-STEEL



FEATURING ''SQUEEZELOCK'' HUB DESIGN

CURVE CROWN DESIGN

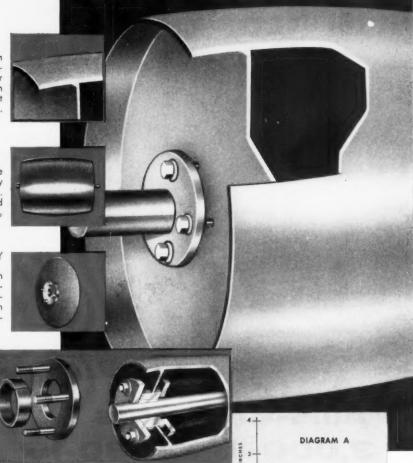
Curve crown on outer ends of rim accurately formed. Revolutionary design eliminates conventional center peak - high point for belt stretch and wear - while increasing belt training effect more than 100%. See diagram (A).

STURDY RIM CONSTRUCTION

Pulley rims are made of one-piece construction, formed absolutely round under hydrostatic pressure. The only seam is machine-welded both inside and out to insure 100% penetration of welds.

ACCURATE END PLATE ASSEMBLY

End plates are machined on both the O.D. and I.D. to insure concentricity between the bore and the outer rim. They are pressed into position for tight fit-up and submerged arcwelded for maximum efficiency.





"SQUEEZELOCK" HUB

Revolutionary design of "Squeezelock" Hub provides gripping power for full torque transmission without the use of keyways and eliminates distorting loads against pulley end plates. Two split tapered bushings are wedged against shaft and pulley end plates by two independent hub plates which are squeezed together by tightening four large diameter bolts.

WRITE TODAY FOR BULLETIN 558



STANDARD PRODUCTS DIVISION

GENERAL OFFICE AND PLANT: 36 RIDGEWAY AVENUE . AURORA, ILLINOIS MFG.

PLANTS AT: CLARKSDALE, MISSISSIPPI . LOS ANGELES, CALIFORNIA . BELLEVILLE, ONTARIO

Circle No. 102 on Reader Service Card for more information

Another NEW Performance Leader-



3,000-lb FTB30-15

You can expect big performance and big savings from the New Allis-Chalmers FTB30-15 lift truck ... and here is why:

It has the power to give you big performance - full 35 hp and 97 ft-lb of torque at working speed.

It has the gradability for big performance - power combined with balance and traction has enabled it to climb grades as steep as 40 percent, loaded.

> "HEFTY" the New FTB30-15 Champ is ready to Save you more, Make you more.

It has the maneuverability for big performance. Outside turning radius is only 64 inches. Steers and handles like a car.

It has the serviceability for big savings. It takes just 20 seconds to prepare the FTB30 for service, 20 minutes to prepare it for overhaul - even a complete clutch change takes only half an hour.

Let your Allis-Chalmers material handling dealer show you the big extras you get with a new FTB30-15 lift truck. Send for descriptive literature. Allis-Chalmers, Milwaukee 1. Wisconsin.





POWER FOR A GROWING WORLD

Circle No. 5 on Reader Service Card for more information

MATERIAL HANDLING ENGINEERING



National President Visits Memphis Chapter

Memphis officers held a dinner meeting recently in honor of National President A. J. Van Benschoten. This proved to be an opportunity for the local officers to get Van Benschoten's advise on local problems, always present when a relatively young chapter is trying to expand into a larger and stronger group. The photograph above shows Van Benschoten presenting a certificate to Paul Flanders upon his selection as vice president of Region VIII. Marshall Tillman, president of Memphis Chapter, looks on. Tillman and Flangers are with International Harvester Co.



Canadian Chapters Run Exposition Conferences

The Hamilton and Toronto Chapters will run conferences for the Canadian Materials Handling Exposition, February 2-6. There will be 10 sessions, with speakers picked from Canadian and U. S. handling men. James Bright, director of the Material Handling Training Conference, will direct the program.

Los Angeles—Under an exchange program, the San Diego Chapter sent a panel to the October meeting of the Los Angeles Chapter. "Aircraft and Missile Handling" was the panel's subject. Members were John C. King (Convair-Astronautics), Howard Fleet (Rohr Aircraft), Peter C. Lehman and Ben J. Handwerker of Convair-San Diego. Don Dearth (Standard Iron Works) was moderator.

SAN FRANCISCO—The Northern California Chapter's November meeting highlighted "Conveyors and Conveyors Systems." This program covered the use of conveyors in warehousing and in bulk and package handling. Representatives of the Conveyor Equipment Manufacturers Association made the presentation.

HAMILTON—The Hamilton District Chapter heard W. B. McClelland, of the W. B. McClelland Co., at the October meeting. McClelland spoke on "Procuring in Pack Lots."

French MH Men Will Study Canadian Methods

A group of industrialists will come from France next June to



study Canadian methods, it was learned by the Montreal Chapter. **Daniel Dagallier,** representing Le Centre d'Information de la Manutention (Material Handling Information Center), said that Canada offered much to learn for the group. In the Quebec province, for example, the Frenchmen would be dealing with men who spoke their language, both conversationally and technically. In the photo, Dagallier (left) confers with Montreal president W. L. Brown.

CLEVELAND—"New Developments on the Conveyor Horizon" were looked at by the Cleveland Chapter in October. W. Gerald Lanterman (Lamson Corp.) spoke on a new conveyor installation and Richard Devries (Rapids Standard) talked on conveying in warehousing.

Strong Education Program in New Jersey

The New Jersey Chapter is sponsoring a 10-session Advanced Material Handling Course, open to members. Well-known material handling experts will be the instructors. And since the course is for professional material handling men, it will be approached from the engineering point of view.



... uniform and consistent strength.

The All-Purpose Sling, for example, embodies the rolled loop and tapered sleeve attachment which, beside developing full catalog strength, makes it safe to handle; no servings, all wire ends are covered by the tapered sleeve. Further, the compact sleeve does away

to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

Your Roebling salesman or distributor can be of large help on any matter dealing with slings. Make use of him.

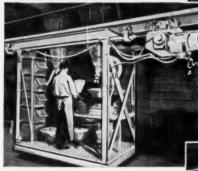
Branch Offices in Principal Cities Subsidiary of The Colorado Fuel and Iron Corporation

Roebling "Flatweave" Slings

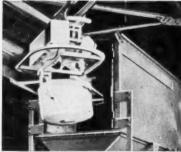
Circle No. 97 on Reader Service Card for more information

Automation in Action!

Louden Selectomatic Dispatch



A Mixing Operator rides a Louden Weighing Lorry selecting the grades of grits according to type of grinding wheel to be manufactured. Similarly, the various grades of bonding agents



After automatically dumping, the carrier proceeds to the cleaning station; opens and shuts doors, starts and stops an air cleaning jet which thoroughly cleans the bucket.



Get the latest information on the best in modern materials handling systems. Write today for your copy of "Economical

Material Handling", a 52-page book full of howto-do-it ideas. If you are interested in automa-tion, ask for the new book on Louden Automatic Dispatch, "Automatic Materials Handling". With either you will receive the latest information on Louden Shok-Pruf Electrification, new safety in power for cranes and monorail systems.



A Mixing Operator loads a carrier after

3 Completely unattended, the Louden Selectomatic Carrier stops at a designated press hopper and dumps the mix.

Automation always brings its greatest gains by the waste it eliminates in handling. It saves time and it saves labor; uses men for their brains rather than their brawn, makes materials handling an aid to their skills rather than an unpleasant handicap. This is the way Louden automatic materials handling serves the world's most modern bonded abrasives plant of the Carborundum Company that was completed recently in Logan, Ohio,

This new Carborundum plant was designed to gain the benefits of automation with a Louden Selectomatic Dispatch System. Materials storage is on the third floor, materials mixing is on the second

Monorail to serve the many presses in this molding department. When you are planning new production facilities or the extension on modernization of your present facilities, discuss your plans or problems with Louden engineers. No company in materials handling engineering has the years of experience, the

> complishment Louden can demonstrate. Write or wire today.



A Subsidiary of Mechanical Handling Systems Inc.

array of equipment or the record of ac-

floor, molding of the mixed materials is

on the first floor, with interfloor transfer

of materials by gravity. The Louden equipment operates in the mixing and

a press on the floor below is ready for a

mix, the touch of a Louden Selectomatic

control button automatically brings an empty carrier into position under the proper loading station, directs the carrier

to the hopper of the proper press, dumps

the mix, sends the carrier to an automatic

cleaning station, and then returns it to the

'empty" line to await another call. Six

such Louden Selectomatic Carriers oper-

ate over more than 1,700 feet of Louden

Mixing operators on Louden Weighing Lorries move from spout to spout drawing grits and bonding materials from the storage above and mix these according to formulae for the grinding wheels to be manufactured. Each mix is placed in a hopper at a loading station. Then, when

molding departments.

SINCE 1867 . . . THE FIRST NAME IN MATERIALS HANDLING

DECEMBER, 1958

Circle No. 67 on Reader Service Card for more information

cranes that stay new



Robbins & Myers cranes have long, productive lives because they combine conservative engineering with quality construction materials - a combination that doesn't permit short-cut manufacturing. Carefully controlled standards are maintained for bridge deflection under load, rigidity, service factor. Your R & M crane is completely assembled and tested before shipment, then match-marked and doweled for perfect reassembly in your plant. R & M builds standard cranes with capacities to 10 tons, spans to 65 feet; larger capacities and longer spans are available in custom designs.

Illustrated above: 15 ton capacity, two hoist, cab controlled crane. Span: 741/2 feet. Bridge control: 6 step variable speed to 250 fpm. Trolley control: 4 step variable speed to 125 fpm.

Send today for our new bulletin describing single and double girder cranes in top-running and underhung designs.

Robbins & Myers, Inc., Hoist & Crane Div., Springfield, O.







Request Bulletin 900

Circle No. 96 on Reader Service Card for more information

WHICH IS RIGHT FOR YOU?

In Heavy Duty or Standard Models...now, there's an Automatic Transporter to fit your job exactly

Choose Heavy Duty Model WPY with the larger battery and greater power for continuous long runs—heavy ramp travel—longer-than-average work days-or get up to two days' light duty operation per charge.

Choose narrow-battery Model WP for work in narrow aisles or other cramped areas—where higher clearance is needed at crown of rampsand many other services where extra battery capacity isn't needed.

Automatic Low Lift Transporters come in both pallet or platform types in the wide and narrow models. Capacities, 4,000 to 15,000 lbs. depending on model. Plug-in charger is optional equipment. All models are available on convenient purchase terms or can be leased for as low as 27¢ per hour.* Mail coupon today for further information.



Model WP works easily in cramped quarters between machines.

AUTOMATIC TRANSPORTATION COMPANY

Division of The Yale & Towne Manufacturing Company

141 West 87th Street, Dept. X-8, Chicago 20, Illinois

WORLD'S LARGEST EXCLUSIVE BUILDERS OF ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

Model WPY, equipped with plug-in charger, gives 45 minutes more working time a day at Crane Company's Chicago tion—saves time, space and money.

*Based on Model WW with battery and charger working 255 eight-hour days a year.



Electric *tomatic* Industrial Trucks

Cost Less to Own...Less to Operate

Circle No. 17 on Reader Service Card for more information

MAIL COUPON FOR DETAILS ...

AUTOMATIC TRANSPORTATION COMPANY Division of The Yale & Towne Manufacturing Company

141 West 87th Street, Dept. X-8, Chicago 20, Illinois

- Please rush me complete information on Automatic Electric
- Lease and purchase plans

Firm......

Address..... City & Zone......State......

'ROUND THE COUNTRY

Air Giant Handled Easily on the Ground

Pan American's first Boeing 707 passenger jet is moved on the ground by this Towkar Model TK30. Manufactured by Silent Hoist & Crane Co., the Towkar is a powerful towing tractor that maneuvers the jet for take-off, inspection, servicing, fueling, and hangar storage. This tractor is capable of a 30,000 pound drawbar pull, and is equipped with a 260 hp heavy duty engine.





Sorting System Slides Shunt Safely

At the Railway Express Terminal in Long Island City a highspeed assorter-conveyor can separate 3,000 packages an hour. This device is a Greller sorting system which uses Grant industrial slides to discharge packages safely and automatically. The assorter-conveyor is 180 feet long, 3 feet wide, and can be operated at speeds from 100 to 300 feet a minute. As packages move past a viewing booth, an operator electronically activates the number of slides (triangularshaped steel fingers) needed to move the package along to the assigned distribution point on the loading platform.

Frame Vehicle Totes 90-Ton Concrete Pipe

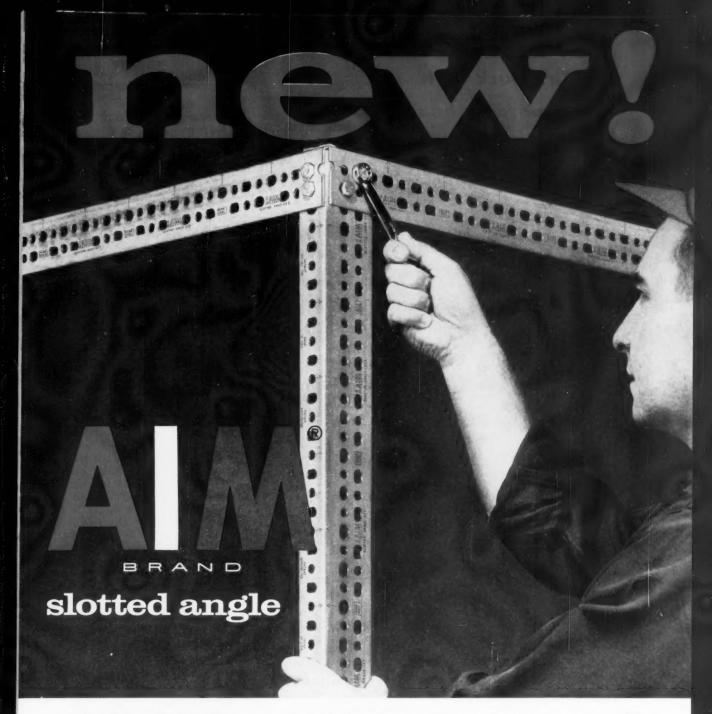
The "Lifter-Tipper" is 30-ton metal vehicle that picks up and moves 24-foot lengths of concrete weighing 90 tons each. It does this job daily at Long Beach harbor. Built and operated by United Concrete Pipe Corp., the Lifter-Tipper is 53 feet high, 31 feet wide, and has a front wheel base of 30 feet. 6 inches. It picks up and carries each section of steel-reinforced concrete pipe around the plant, then tips it to a horizontal position when needed. Cushioning and supporting it on the fine sand are twelve 14.00 x 24 Goodrich tires.





Pump Handles Rags, Pebbles, Broken Glass

That's the type of material they had to pump in a sewage treatment plant in Oakland, California. This pump-killing sludge had to be scraped from the bottom of sedimentation basins and transferred to sludge digestion tanks. High maintenance costs on the pumps being used started the plant engineers investigating new transfer devices. They tried the Moyno "progressing cavity" pump made by Robbins & Myers, Inc. The pump (arrow) ran for 19 months at full capacity without maintenance. When it was taken down, the cost of repair was less than that of previous equipment.



faster-framing • precision-quality • 100% reusable

This versatile new Acme Steel framing metal brings amazing ease and economy to building durable structures and equipment. Its pattern makes it ideal. Scientifically spaced slot-and-round-hole pattern simplifies assembly. Friction-Joints can be made by bolting through slots when speed and convenience are most important. For maximum strength, bolting through round

holes forms a Lock-Joint that just won't budge. Structural bolts with a 2000-pound safe load capacity can be applied with a hand or power wrench. Just plan, measure, cut and bolt.

AIM Brand Slotted Angle is coldrolled galvanized steel for dependable strength and rigidity. 10 or 12 foot lengths come in packages of 10 pieces with bolts and nuts. Available in two sizes: Standard 225-80 ($2\frac{1}{4}$ " x $1\frac{1}{2}$ " x .080") and Heavy-duty 300-104 (3" x $1\frac{1}{2}$ " x .104").

FREE! Get ideas from the AIM Brand Slotted Angle brochure for fixtures and equipment you can build with less material, fewer manhours. Write Dept. FDD-128, Fabricated Materials Division, Acme Steel Company, Chicago 27, Ill.



AIM Brand Slotted Angle



The truck with "boarding house reach" INCREASES WAREHOUSE CAPACITY

... as much as 50%



*For exact aisle width, ask Raymond representative to survey

THE RAYMOND CORPORATION

3331 Madison St., Greene, N.Y.

Please send Bulletin on Raymond Reach-Fork. I am interested in:

- ☐ 2,000 lb. cap. Reach-Fork. ☐ 3,000 lb. cap. Reach-Fork.
- ☐ Have a representative call.

MAIL COUPON TODAY

NAME	TITLE
COMPANY	
STREET	
	CTATE

Circle No. 91 on Reader Service Card for more information

HANDLING 'ROUND THE COUNTRY

Continued

Space Going Fast for MHI Exposition

There has been a heavy demand for exhibit space in the Material Handling Institute's Exposition of 1959. According to the show chairman, the big demand for space has made necassary the opening of two additional areas in the Cleveland Public Auditorium. Some exhibitors have reserved display space on the Auditorium's lakeside loading dock, where they can show handling equipment being used outdoors. Large display spaces in the Auditorium have also been in demand.

Conference Studies Packagina Standardization

Standardization of military packaging material was the main theme of the Air Material Command's 1958 Packaging and Material Handling Conference sponsored by San Bernardino Air Material Area. The 300 military and civilian packaging and material handling experts agreed that standardization procedures should be speeded up. They also recommended that delays be eliminated in circulating approval information on new materials and in obtaining coordinated specifications. Colonel A. J. Mason, conference chairman, promised to take action with the Air Material Command Headquarters.

Representatives **Appointed Recently**

Atlas Lift Truck Rentals. Inc. and Atlas Pallet & Lumber Sales Inc., (Chicago) have added 20,000 square feet of work space. They moved into a new building, which gives them this additional area for warehousing and distributing material handling equipment.

Southland Battery Co. (Dallas) is exclusive sales representative in the states of Texas and Oklahoma for K W Battery Co. The company will handle battery sales in industrial and railroad accounts.

Closing Date Extended for Industry Awards Program

The Material Handling Institute announces that the closing date for its Industry Awards Program in the metal stamping industry has been extended 90 days, until January 15, 1959. Entries should be based on material handling systems that lead to increased productivity, lowered cost, or increased protection. The program is conducted with the cooperation of the Pressed Metal Institute.

The National Metal Edge Box Co. has authorized the Daytona Paper Co. (Daytona Beach) as a distributor for the Daytona Beach area. The Dothan Paper Co. (Dothan, Ala.) is distributor for that area. The Central Paper Co. (Orlando, Fla.) will cover the Orlando area.

The Yale and Towne Manufacturing Company's Trojan line of tractor shovels will have a new Tennessee distributor. The San-Day Equipment Co. (Knoxville) has been recently established as a distributor of construction equipment. San-Day will maintain a full inventory of Trojan parts.

Northland Equipment Co. (Detroit) will distribute the line of power sweepers made by Clarke Sanding Machine Co.

H. E. Fortna & Brothers Co. are exclusive sales and engineering representatives for the Becker Crane & Conveyor Co. Their territory includes eastern Pennsylvania and southern New Jersey.

The Pat Donovan Co. (East Chicago) has become exclusive representative for the Magnesium Co. of America. in the Dayton trade area.

Hamerslag Equipment Co. (San Francisco) has been appointed Northern California representative for Alvey Conveyor Manufacturing Co.

Cost-cutting FACTS & IDEAS worth thousands of dollars!



Here . . . at your fingertips . . . are the dollar-and-space - saving facts about handling unit loads in narrow aisles. Learn how you can store more goods in your present warehouse. Increase capacity as much as 50% . . . make new floor space more productive with narrow aisles. This new 24 page reference book contains complete specifications of Raymond hydraulic and electric pallet handling trucks for every size and type of operation. Profusely illustrated. Send for your FREE copy today!

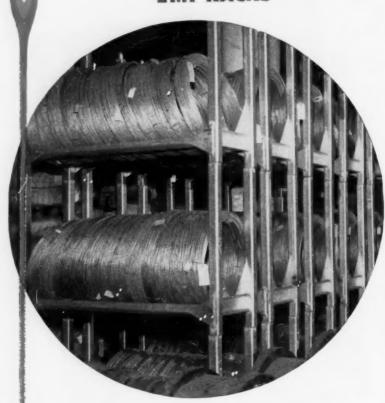
The RAYMOND CORPORATION 3372 Modison St., Greene, N. Y. Pallet Handling in Narrow COMPANY STREET

CITY

Circle No. 92 on Reader Service Card for more information

put your upper space to work!

get your materials off the ground with EMI RACKS



you can stack or ship anything in any industry on EMI RACKS



COMPLETE METAL WORKING FACILITIES INCLUDING . . .

TUBING—Square, Round, Rectangular and special shapes

WIRE MESH—All Gages
SPECIAL FABRICATIONS

Write for complete catalog!

EQUIPMENT MEG. INC.

21552 HOOVER ROAD DETROIT 5, MICHIGAN

Circle No. 39 on Reader Service Card for more information



December 2

Electric Overhead Crane Institute Annual meeting Statler Hotel Washington, D. C.

December 7-9

The Material Handling Institute, Inc. Roosevelt Hotel New York

December 11

Association of Lift Truck & Portable Elevator Mfgrs. Roosevelt Hotel New York

January 22

Hoist Manufacturers Association Annual meeting Palm Beach Biltmore Palm Beach, Florida

January 26-29

Plant Maintenance & Engineering Show Public Auditorium Cleveland

February 1-3

National Wooden Pallet Manufacturers Association 12th semi-annual meeting Hollywood Beach Hotel Hollywood, Florida

February 2-6

Material Handling Exposition and Conference Sponsored by Hamilton and Toronto Chapters, AMHS Automotive Building Toronto

February 5-6

Industrial Engineering Dept., Illinois Tech, and Armour Research Foundation Industrial Management Engineering Conference Illinois Institute of Technology Chicago

February 6-7

University of California Eleventh Annual Industrial Engineering Institute U. of C. Campuses Berkeley and Los Angeles



Materials handling

accounts for about 30¢ of the average

manufacturer's production cost dollar.

Announcing a giant show

devoted to all the newest ideas and equipment

to help reduce this cost . . .

Here, at the biggest materials handling show ever held in Canada, will be displayed and demonstrated the most by the data grainwant produced.

held in Canada, will be displayed and demonstrated, the most up-to-date equipment produced by manufacturers in Canada, the United Kingdom, the United States and other countries to meet every specific handling requirement . . . equipment to save money and effort in every plant, warehouse, yard, quarry or mine.

Concurrently with Exposition will be the "PLANNED HANDLING FOR PROGRESS AND PROFITS" Conference featuring informative talks by outstanding speakers on handling problems, new methods and equipment that can expedite flow of goods, increase output, cut costs.

Occupying 120,000 square feet of floor space, the show will be held in the magnificent Automotive Building, Exhibition Park in Toronto, Ontario—right in the heart of industrial Canada within easy travelling distance of more than 60% of Canada's industries. The outstanding event of the year for all materials handling men. Coupon will bring you further details by return mail.

ORGANIZED BY



CANADIAN INDUSTRY EXPOSITION

FEB. 2-6, 1959 EXHIBITION PARK TORONTO, CANADA

MATERIALS HANDLING IN CANADIAN INDUSTRY EXPOSITION, 2 Bloor Street East, Toronto 5, Ontario, Canada

Please send me further details on the MATERIALS HANDLING IN CANADIAN INDUSTRY EXPOSITION AND CONFERENCE.

I am interested as a; visitor 🗌 possible exhibitor 🗍

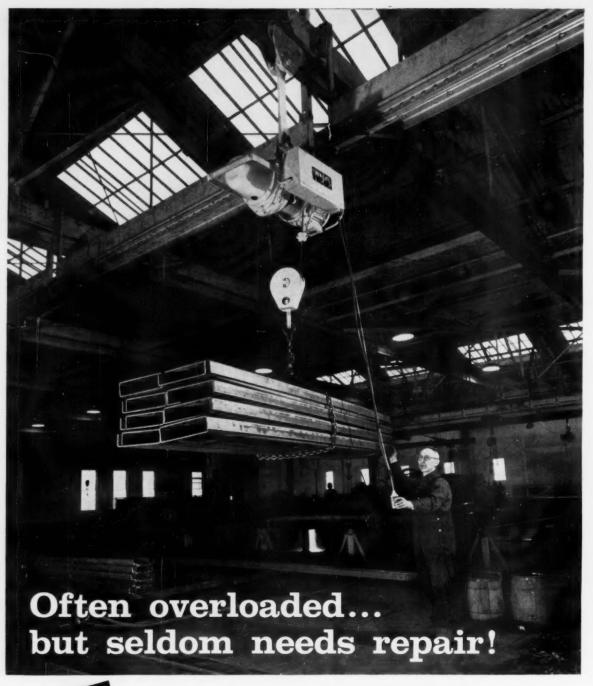
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It's a Pall HEVI-LIFT HOIST with maintenance-free RCD brake

In handling steel sheets, beams, and tubes, this 6,000-lb. capacity Hevi-Lift® frequently is loaded beyond rated capacity. Yet downtime is half what you'd expect.

Maintenance records show that more than 50% of hoist troubles occur at the brake. But not so with a P&H Hevi-Lift. Its mill-type RCD brake has fewer parts to break down. Total brake movement is only 1/32 of an

inch - there's no violent hammer-action to cause wear.

Send for Bulletin H-5 which tells you the complete story of P&H Hevi-Lifts (capacities, 1,000-40,000 lbs.) See your P&H distributor — or write Dept 206C, Harnischfeger Corp., Milwaukee 46, Wisconsin.

HARNISCHFEGER

PsH . . . quality and service for 74 years

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MATERIAL HANDLING ENGINEERING



Photo courtesy of Cities Service Oil Company (Delaware)

Now! Stack 30% higher...load into boxcars too!

The Clarklift fork trucks pictured above are demonstrating a new dual function. They stack 30% higher than equipment of similar, retracted mast height... can also drive through low boxcar doors and other tight clearances. It's made possible by Clark's new Triple Stage Upright.

Actually, it means you're getting two machines in one. You are able to take better advantage of the *full* height of your warehouse . . . yet, use the *same* fork truck for loading rail cars or highway

trucks, low-door elevators, etc. The Triple Stage Upright enables your equipment to work full time, and on many varied jobs with no stacking height loss, no clearance problems, no work stoppages.

A specification sheet showing complete details is available on request.

Simply write: Triple Stage Upright, Clark Equipment Company, Battle Creek, Michigan.



CLARKLIFT is a trademark of Clark Equipment Company

materials-handling





NEW AND UNUSUAL APPLICATIONS OF BASSICK CASTERS THAT MIGHT BE ADAPTED TO YOUR HANDLING PROBLEMS



Handles 1.25 million lbs. of paper a day

Philadelphia Bulletin's huge new plant uses an infloor dragline system, carts equipped with Bassick casters, to unload, store, and transport one-ton rolls of newsprint. Lewis-Shepard, a leading materials-handling equipment manufacturer, selected Bassick casters for the carts. Casters have to be built for top performance, low maintenance and long life when an expert in the field chooses them. A point worth remembering next time you need casters.

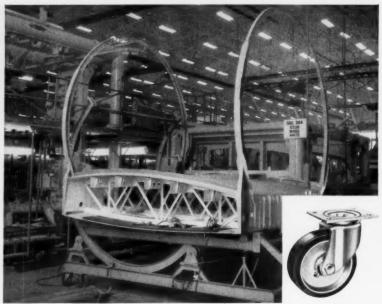


Mother substitute rides casters

Using a caster as the rear landing gear of a decoy, Dr. E. H. Hess, Associate Professor of Psychology at the University of Chicago, studies duck behavior patterns and possible human parallels. The Hess decoys, wired for sound and moving by remote control are used to discover how very early impressions affect duck's later social patterns.

New ideas with casters

Your local distributor who handles Bassick casters can often suggest new ways of moving materials that may save you time or money. He can also recommend the most efficient caster for your specific job and keep you up to date on new caster developments applicable to your operation. Call on him... he'll be glad to work with you and, where advisable, call in a Bassick Field Engineer for consultation.



Casters aid PRODUCIBILITY of Lockheed prop-jet Electra

This short-to-medium-haul aircraft was designed for producibility. It had to be if agreements for performance, price and delivery were to be held firm.

Every production step at Lockheed Aircraft Corporation, Burbank, California, was planned to save time, save materials, save money.

That's why we're especially pleased that so many Bassick casters were used in assembling the Electra... and that they were used in so many ways. Typical is the mid-body wing cell, the Electra's central structural member, shown on Bassick casters above.

Keeping costs down on your production job... or any materials handling job, for that matter... starts with careful planning. And that's the point at which Bassick distributors or Bassick Engineers can help you most. Call on them.



Plant model sectionalized on casters

Sikorsky Aircraft, Division of United Aircraft Corporation has built the scale model of their plant at Stratford, Connecticut, on a sectionalized table. Each section rolls away on Bassick grooved wheel casters to give personnel access to center portions, otherwise hard to get at. With casters operating on inverted angle iron tracks, the sections roll back into exact position. This way you can make a model big enough to work with and yet get inside for close work.



BASSICK COMPANY BRIDGEPORT 5, CONN. IN CANADA: BELLEVILLE, ONT.



Circle No. 19 on Reader Service Card for more information



Free Demonstration Anywhere in Your Plant

See proof that the 'Budgit' Chain Block can cut <u>your</u> load handling costs

Be convinced — take us up on this free demonstration offer now.

Choose any plant area where lifting is a problem and a hoist can be hung. Then call your local 'Budgit' Distributor. See the yellow pages of your phone book — or write us for the name of the one nearby. He will bring and hang up a 'Budgit'. He will prove hoisting is an easy one-man job that frees manpower for other work.

'BUDGIT' SAVES TIME, ENERGY, MONEY

You will learn how only 25 lbs. of muscle effort can lift a 500 lb. load. You will see how fast the big, auto-

matic load brake operates in spotting loads exactly where you want them. You will learn how light weight and strength are combined to produce a safe hoist that cuts lifting costs in emergencies, maintenance, construction, production.

All this and more are yours to see right in your own plant — without obligation.

'Budgit' Aluminum Chain Blocks are made in ½ to 10-ton capacities, in top hook and Army-Type trolley styles. Spark and corrosion resistant models, too. Prices start at \$125.

Call your Shaw-Box distributor today or ask us for Bulletins 15010-10, 15010-16, 15010-17, 15010-18. Authorized service stations from coast to coast save time, trouble and money for every 'Budgit' user.



Budgit CHAIN BLOCKS

-MANNING, MAXWELL & MOORE, INC.-

SHAW-BOX CRANE & HOIST DIVISION

366 W. Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, and 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments.

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

Efficient . . . Dependable Power For All



■ The MOTO-TRUC power unit — heart of both walkie and small rider models — provides the three essential features demanded by every experienced truck user:

 High Dependability — built to take the punishment of the toughest handling jobs — with a minimum of down-time,

 Peak Efficiency — gets more work done at less cost—uses battery power economically.

Easy Maintenance — Completely accessible
 — simple construction that is quick and
 easy to service.

In addition to these basic operating advantages,

the MOTO-TRUC power plant features an automotive type internal expanding brake; geartype, drive reduction that is sealed against entry of dirt; a two-piece cast aluminum housing that can be removed in seconds to expose all operating parts.

This drive unit is typical of the rugged simplicity of all MOTO-TRUC components . . . built to give you more efficient handling at lower cost. So, be sure to investigate the complete line of competitively priced MOTO-TRUC walkie and small rider trucks before you buy.

Largest Exclusive Manufacturers of "Walkie" and "Ride-A-Man" Trucks

The MOTO-TRUC Co.



Ask for: Catalog 56W
on walkie trucks
Catalog 56R on
Ride-A-Man models

1955 EAST 59th ST. CLEVELAND 3, OHIO

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MATERIAL HANDLING ENGINEERING



One set of spare parts serves all these 18 HERCULES engines

Here's parts interchangeability to warm a maintenance man's heart! Hercules designed the new DD diesel and GO gasoline engines with the user in mind: succeeded in achieving a unique degree of interchangeability that reduces spare parts requirements for Hercules-powered equipment to a minimum.

Actually, the illustration above doesn't tell the whole story. To do that, we'd have to show 6 power units as well as all 18 models of 3, 4, and 6-cylinder engines available in the DD and GO series—a total of 24 power plants using many of the same wearing parts!

You can take advantage of this maintenance economy by specifying Hercules diesel, gasoline, or LP-gas power for the equipment you buy. If you'd like the full story on these modern engines, write Hercules Motors Corp., Canton 2, Ohio—or call your Hercules distributor: there's one in the Hercules worldwide network near you.



Canton, Ohio



GIVE INDUSTRIAL USERS A CHOICE OF EQUIPMENT

WIDEST SELECTION OF ATTACHMENTS INCREASE UTILITY

Only HOUGH offers the industrial user a choice of three compact, maneuverable tractor-shovels with front-wheel-drive and rear-wheel-steer, plus larger 4wheel-drive models up to 9,000 lb. carry capacity.

Model HA-Standard of the Industry

More than 10,000 of these low-cost loaders, working in all kinds of industries, have more than proven their ability to move bulk materials economically on either an intermittent or a continuous basis.

Bucket sizes from 12 to 36 cu, ft, are available for the Model HA for handling various materials within the rated carry capacity of 2,000 lbs. The bucket can tip back 40° at ground level and develops a breakout force of 3,100 lbs.

New Model H-25 is without equal

The recently introduced Model H-25, with 2,500 lbs. carry capacity and 4,500 lbs. breakout force provides additional productive capacity in a small, compact unit. Its power-shift transmission, having two speeds forward and reverse, "non-spin" differential and power-steer—all exclusive features in its size range—combine with 72-inch turning radius to make it the most maneuverable unit on the market.

Better penetration, bigger loads and faster operational cycles recommend it for continuous operations where volume handling is desired.

Model HAH-larger, heavier

This machine has a carry capacity of 3,000 lbs, with a breakout force of 4,500 lbs, and is recommended for both exterior and interior industrial applications. It has torque-converter drive and four speeds forward and reverse.

A full 45 degrees of bucket tipback at ground level enables this "PAYLOADER" to get and retain heaping loads and carry them low and close. Power-steer and exclusive "non-spin" differential provide easy handling and better traction.

Four-wheel-drive models

There are some industrial applications for bulk handling, usually exterior ones, where there is plenty of room for maneuvering and it is essential to handle large tonnages of various materials. In these instances larger, four-wheel-drive "PAYLOADER" tractorshovels are the answer.

These larger units are available with carrying capacities from 5,000 to 9,000 lbs., and they all have power-shift transmissions, power-steer, power brakes and numerous other advanced features associated with HOUGH equipment.

Attachments to multiply uses

The widest choice of attachments are available for "PAYLOADER" tractor-shovels to handle extra jobs—fork lifts, crane-hooks, pick-up sweepers, scrap grapples, side-booms, snow plows and others.

THE FRANK G. HO 731 Sunnyside Ave., Libe Send data on "PAYLOA!	ertyville, III.	H
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Company		SUBSIDIARY
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City	State	
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HOUGH

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY





Model HA — 2,000 lbs. carry capacity.



Model HAH - 3,000 lbs. carry capacity.



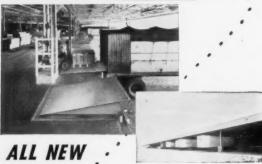
Model H-25 — 2,500 lbs. carry capacity.



Four-wheel-drive models 5,000 to 9,000 lbs. carry capacity.

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at Ford Motor Co. Pool minal, Detroit, Michigan.

FULLY AUTOMATIC DOCKBOARDS

FIRST COST IS LAST COST

COMPLETELY

AUTOMATIC

The truck supplies the power . . . no dock attendant needed, no

buttons, valves, or

controls.

Simple counterweight system . . . no air, electric, or hydraulic power . . . built outlive the dock.

RECESSED AND PACKAGED MODELS

in lengths to solve all loading problems ... for new or ex-

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THE MOST VERSATILE INDUSTRIAL TRUCK IN THE WORLD! LAHER - America's foremost builder of quality electric cars and trucks for industry and golf, introduces the all-purpose LAHER All-Job Convertible. Indoors or outdoors regardless of weather, whatever the job - the sensational LAHER All-Job will do it better, faster and cheaper! CHECK THESE EXCLUSIVE LAHER FEATURES:
edg up to 25 MPH distance
to 100 miles.

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attention of the economical opstrian.

AL-RATIO for economical opstrian. Speeds up to 25 MPH - distance up to 100 miles. Weatherproof easy-on, easy-off top. . DUAL-RATIO for economical op-Two sets of batteries. Clean, silent, odorless, no years - yet operate for about 1/5 costs of comparable gas driven equipment. Phenomenal AIR-VAC front spring suspension. Cost conscieus companies in every major industry are switching to LAHER Electrics (aircraft industries now have thousands in use). 20 MODELS TO FIT EVERY NEED Write today for full information.

NOISELESS WITH JARVITE

LAHER SPRING & TIRE CORP.

2615 Magnolia St., Oakland, Calif. . 300 Madison Ave., Memphis, Tenn.

the long wearing, hard rubber compound that's kind to your floors.

"Jarvite" high-strength, hard rubber compound performs capably in humid temperatures ranging from 32° to 100° F... will not develop soft spots or damage wood floors, unaffected by fats such as shortening, fruit acids, milk acids, flour, etc.

Protective stud cap shields vital grease-packed raceways from steam and hot water . . bearings are packed with high quality, high-low temperature water resistant grease.

Dust and moisture shield protects cup-and-cone wheel bearing assembly from hot water, steam, lint dust, sawdust, threads, etc.

> Intermediate raceway is also designed to provide a combination dust guard and moisture shield to protect the lubrication.

> > Model 5"-48-116

TESTED IN BAKERIES AND DAIRIES AND PROVED RESISTANT TO:

Steam and Hot Water Cleaning

Food Freezing Operations Fruit Acids Sanitation Treatment Fats

> Milk Acids **High Humidity**

Wide temperature extremes 32° to 100° F Chipping Impact Frozen Dough

ARE YOUR CASTERS SUBJECTED TO CONDITIONS LIKE THESE?

If so, you can reduce maintenance costs with the J & J Model 5"-48-116 Caster with Jarvite tire. Jarvite withstands heavy loads (up to 1800 lbs.) without flattening, yet permits smooth movement over fine wood floors without gouging, marking or rutting the surface.

Model 48-116 casters are designed throughout for rugged resistance to adverse conditions, particularly those involving moisture and extremes of temperature. Note the features illustrated at left: your assurance of top performance and long life service.



*(Set of four 5" casters)

arvis, Inc. PALMER, MASSACHUSETTS

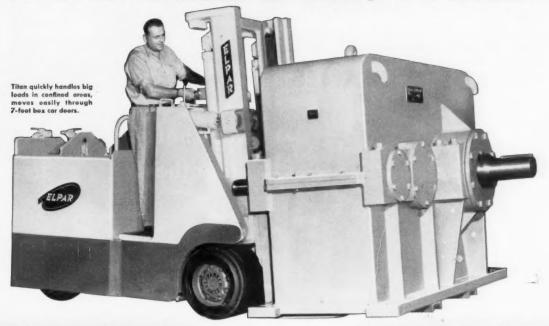
Sold Through Quality Dealers

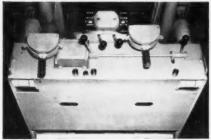
Canada: Jarvis & Jarvis of Canada, 1744 William St., Montreal, Que.

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MATERIAL HANDLING ENGINEERING

NEW ELPAR TITAN





Dual controls.



"Picture window" vision



Easy access to batteries, rugged uprights.

From Every Angle... Unmatched for Heavy Load Handling

In 15,000 to 20,000-pound capacities, the *all-new* ELPAR Titan fork and ram truck series promises *all-around* handling efficiency:

For your production department, exceptional compactness, high travel and lift speeds, freight car maneuverability.

For your operator, clear visibility in every direction, dual controls, power steering.

For your safety department, ELPAR's new "Tri-Safe" braking system . . . three independent brakes — dynamic, hydraulic, mechanical — act in sequence and are controlled by a single toe bar.

For maintenance, quick battery change, troublefree upright design, traditional ELPAR electric truck dependability.



Get the Full Story...SEND FOR TITAN SERIES BULLETIN
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THE ELWELL-PARKER ELECTRIC COMPANY

4291 St. Clair Avenue

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Twice the Life...1/3rd the Operating Costs

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HANDLE HEAVY LOADS Anytime! Anywhere! with RUGER MOBILE HYDRAULIC CRANES



Lift and Tilt Drums

TYPICAL EXAMPLE: users handling strip steel calls report savings of 43% to 80% in capital investment and 50% to 75% in man hours. Photograph, courtesy of Arens Controls Inc., Evanston, Illinois.

... THE WORLD'S MOST VERSATILE AND **ECONOMICAL MULTI-PURPOSE CRANES** FOR LIFTING AND MOVING

A mobile hydraulic crane with 1000 uses, the RUGER rolls anywhere, . . reaches in-under-over anytime . almost all lifting or moving jobs.

No extra capital investment necessary to combine most lifting and transporting operations with one RUGER multi-purpose crane.

The RUGER line (1/4 to 3 ton capacities) provides maximum safety and adaptability which includes variable speed hydraulic controls.

Manual and electric models available are floor . . . truck . . . convertible floor and truck . . . short . short mast . . . high mast . . . wide base . . . adjustable legs and retractable outrigger for side lifting. Priced as low as \$149.00.

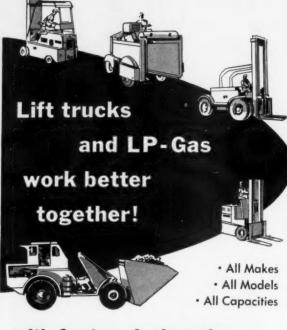
Send for descriptive literature now.





RUGER EQUIPMENT IN

Uhrichsville, Ohio Circle 99 on Reader Service Card for more information



with Century Carburetion

IT'S A FACT! Century Carburetion makes lift trucks work better on LP-Gas. Why? Because Century carburetors are individually designed for each make and model of lift truck . . . because they are calibrated to the engine's performance curve... because all units are balanced to the engine's economy and horsepower requirements. You get instant starting, perfect idling and full power under all conditions.

Century's "progressive jet" carburetion, a product of Borg-Warner, has the fewest number of parts-only three major units. They are compact, light and the smallest in envelope size for their horsepower rating. Easy to install. Require only tune-up adjustment. No bleed lines or idle lines.

Write for new brochure entitled "How to Reduce Fork Lift Operational Costs With LP-Gas."



Export Sales: Sin Par Automotive Div., Singer Products Co., 15 Moore St., New York 4, N.Y. Circle 24 on Reader Service Card for more information MATERIAL HANDLING ENGINEERING

A Few Well Deserved Orchids

by John Mount, president, SPHE



OUR 1958 Show and Exposition, along with the Short Course and National Packaging and Material Handling Com-

petition, is now a thing of the past. While a little late, I would like to take this opportunity to thank all those who participated. Special thanks to Paul Schreck, our show chairman.

The interest in the Competition was again one of the hilights of the show. Unfortunately there were only a few entries in some of the categories, but all entries proved interesting to the many viewers thronging around the Competition area. I'm sure the winning entries found the effort well worth while; they will certainly appreciate the national prestige they receive. I would like to thank each of the judges. They did a fine job. My thanks in particular to Joe Krager, the vice chairman, whose untiring efforts made the Competition a success.

Our Short Course, under the Extension Division of the University of Illinois, again proved to be tops in know-how. The co-chairmen, Joe Carrington and Bob Vaughn, did a swell job. They're to be congratulated. And of course thanks are due to each and every panel chairman, and to their speakers. One of the bright spots of the Short Course was our joint session with the Packaging Institute. Its response proved that it should be repeated.

This year's show was smaller

than past years. Many exhibitors who had been with us for years decided not to show this year. There were many reasons. I think they made a mistake, for most of the exhibitors I spoke to were very happy with the interest their booth received.

And thus another year ends. With economic conditions as they were, it has been a trying year for all of us. But the prospects for next year are good, both for industry and our Society. It's up to you as individual members how good our Society will be, and how far it will go. Let's all get together and push; let's make 1959 a top year.

Carney Quits SPHE Post

Charles J. Carney, Jr. has resigned as managing director of the Society of Packaging and Handling Engineers. The resignation was submitted and accepted at the meeting of the National Board of Directors in Chicago October 17th. It becomes effective December 31, 1958.

In accepting the resignation, the Board of Directors expressed its appreciation to Carney for his long service as managing director, during which time the Society was built up to a position of national prominence.

PHILADELPHIA, PA.—A plant tour of C. Schmidt & Sons Brewery was the feature of the last meeting of

the Philadelphia Regional Chapter. After the tour **James Layton**, industrial engineer of the Schmidt plant, discussed the company's material handling procedures with the group.

SAN FRANCISCO, CALIF.—"An American Look at European Packaging" was the theme of a recent meeting of the Northern California Chapter. Speaker was Alan Lynn, a government consultant just back from Vienna.

Baltimore, Md.—The Maryland Chapter held its Third Annual Industrial Packaging and Material Handling Exhibit November 25th. The show was held at Baltimore's Fifth District Armory, and included exhibitors from Maryland and surrounding areas.

St. Paul, Minn.—The revised Constitution and By-Laws, voted and approved in Chicago October 17, was discussed at the Minnesota Chapter last month.

HILLSIDE, N. J.—The JETEC Story was presented to members of the Eastern Chapter recently. The Joint Electron Tube Engineering Council is an outstanding example of industry-wide cooperation in solving packaging problems. The inside story of this group's work was told by R. C. Allen, Radio Corporation of America, Merian, Ind.

COLUMBUS, OHIO—Mervin Roland, field representative for Wolf Envelope Co., was guest speaker at a recent meeting of the Central Ohio Chapter. He spoke on recent developments in envelopes, espe-



By specifying Acme Standard Attachments wherever possible, a considerable saving in time and money can be made. These low cost attachments are made

to meet most ordinary requirements. They can be furnished individually, separate from the chain or they can be assembled into the chain either in riveted or detachable type.

SPECIAL CONVEYOR ATTACHMENTS

Possibilities for modification of Acme Standard Chains and Attachments are practically endless. In all adaptations, Acme engineers are skilled in retaining as many standard parts as possible to reduce cost, or design special attachments for your particular requirements. All Acme conveyor attachments and chains are available in standard, stainless steel or plated.

Write or call your local Industrial Distributors or our engineering department for time and money saving suggestions.

Write Dept. 29B for new 100-page illustrated catalog, including new engineering section showing 36 methods of chain adjustments.



COMPLETE LINE OF ROLLER CHAINS AND SPROCKETS • DOUBLE PITCH CON-VEYOR CHAINS • STAINLESS STEEL CHAINS • CABLE CHAINS • FLEXIBLE COUPLINGS • STANDARD AND SPECIAL ATTACHMENTS Circle No. 2 on Reader Service Card for more information

NEWS ABOUT SPHE

Continued

cially graphic arts developments. and their applications to packaging problems.

Los Angeles, Calif.-Members of the Southern California Chapter recently heard a panel discussion on "Material Handling in the Field of Aircraft Production." This meeting was held jointly with the Los Angeles Chapter of the American Material Handling Society.

CHICAGO, ILL.-What is a package design consultant? This question was answered recently by Robert S. Dickens, speaking to the Illinois Chapter. Dickens discussed: Coordinating Packaging with Design, Research, and Production.

SEATTLE, WASH .- New officers of the Seattle Chapter are: Charles W. Long, United Control Corp., president; Bernard Alleman, Industrial Crating and Packing, Inc., vice president; Edward Pugel, Longview Fibre Co., secretary; and Robert Bell, U. S. Army, treasurer.

Try Special Steel Pallets for Hot Loads

Cochran Foil Co. puts steel pallets into 960-degree ovens, leaves them there 12 hours, and takes



them out undamaged. No warpage, no weakening.

The pallets (750 of them) were made by Republic Steel's Pressed Steel Division. They're used for annealing 6.000-pound aluminum coils. They're made of a special alloy called Republic 50.

Regular steel pallets used to warp, weaken, had a 2-year life span. Cochran estimates the new ones will last at least 10 years, and stay in perfect shape.

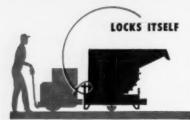
MATERIAL HANDLING ENGINEERING

Call ACM









Cuts handling time ... and costs...in half

Here's the fastest, lowest cost method ever devised for handling all kinds of bulk materials . . . hot or cold . . . wet or dry . . .

Punch Press Parts . . . Cinders Hot Forging or Castings . . . Scrap Metal Pickles . . . Soybean Meal

A Roura Hopper fits any standard lift truck . . . attached or detached in seconds . . . can't slip off. One man does the entire job. Picks up loaded Hopper with lift truck . . transports it to destination . . . flips the latch . . . and the Hopper automatically dumps its load, rights itself, locks itself. Cuts costs 50% or more.

They're sturdily made of heavy 36 plate with continuous arc-welded joints. Five sizes from ½ to 2 yards capacity. Fitted with live skids or a choice of wheels. Standard models available for immediate shipment from stock. For special applications they can be made of stainless steel or galvanized.

WANT MORE FACTS?

We'll give you full details . . . without obligation . . . if you'll attach this coupon to your letterhead . . . sign your name . . . and mail to ..

ROURA IRON WORKS, INC. 1411 Woodland Ave., Detroit 11, Michigan

Circle 98 on Reader Service Card

MEN IN THE NEWS

At Exide Industrial Div., The Electric Storage Battery Co. . . . the Chicago area branch sales



manager is Evans Taylor. He will be responsible for industrial battery sales service in northern Illinois, Indiana, eastern Iowa, eastern

Wisconsin and the northern Michigan peninsula. He has been with Exide since 1936.

At Industrial Products Div., Warner Electric Brake & Clutch Co. . . . Ray W. Dollar has been appointed Atlanta sales representative. He will supervise sales and service activities in Georgia, Florida, Alabama, and Tennessee.

At Anchor Steel & Conveyor Co. . . . Robert W. Shaneck will head the recently established sales office in Dayton, Ohio, from which the central and southwestern Ohio areas will be serviced.

At Hawkeye Products Corp. . . . Edward K. Graham, Jr. is area sales representative. He will be responsible for all sales in the Texas Gulf Coast area and southwestern Louisiana. His office will be in Houston.

At Construction Machinery Div., Clark Equipment Co., ... Jack B. Hart is now the Washing-



ton representative. He will negotiate government business and federal contracts. A Clark employee for 111/2 years. Hart had been export

manager for CMD until 1956, when he was appointed sales manager of construction machinery for Clark Equipment International, C. A., a subsidiary.

At Taylor Fibre Co. . . . salesengineer assigned to the La Verne, Calif. office is Clifford C. Burke. He will be responsible for sales of the company's laminated plastics and vulcanized fibre in Southern California.

At Hettrick Mfg. Co. . . . Roy F. Blaha will be in chargeof Cleveland area sales.

At Richardson Scale Co. . . . Homer H. Hazelton is the newly-appointed Pacific Northwest representative. He has had previous sales and service experience at the Wichita and Chicago branch offices.

At Allis-Chalmers Mfg. Co. . . . two appointments have been announced. Ralph L. Haney is manager of the Philadelphia district and Charles E. Dandois is manager of the Allentown, Pa. district.

At Bucyrus-Erie Co. . . . Phil Peterson is district sales representative. His territory will in-



clude Pennsylvania, Virginia, West Virginia and Maryland, lower New Jersey and the District of Columbia, His headquarters will be in the com-

pany's New York City office. He has been with the company since August 1.

At The Yale & Towne Mfg. Co. . . . J. N. McEntee, formerly sales manager of the industrial lift truck sales and service branch in Los Angeles, was promoted to branch manager.

At The Rapids-Standard Co. Inc. . . recent appointments have added three men to the sales engineering force-W. R. Maxted, Chris Sigardson, Jr., and J. F. Cutler. Maxted, a mechanical engineering graduate of Purdue was recently with the Palmer Bee Co. Sigardson attended Michigan State University and Detroit College of Engineering. He was formerly associated with Giffels and Vallet, Inc. and Prab Conveyors, Inc. and Hapman-Dutton Co. Cutler, a General Motors Institute graduate was formerly with Buick Motors in Flint, Mich.

At Brown Trailer Div., Clark Equipment Co., . . . sales representative in the Dayton, Ohio, area



is Thomas E.
Martin. For
eight years, he
had been with
Freuhauf Trailer
Co. After that he
was Dayton distributor for
Copco Trailer

since August, 1957. His office will be at Miami Industrial Trucks, Inc. in Dayton.

At C. R. Daniels, Inc. . . . Albert S. Vetter is the newest addition to the belting division sales department. He will work out of the New York office.

At Jeffrey Mfg, Co. . . . two new district office managers have been named. William Davis will head the office at Burlingame, Calif., and Elmer Longnecker will take over the Detroit office. Both appointments became effective July 1st.

At Ingersoll Products Div., Borg-Warner Corp. . . . B. A. Lucas, Jr. has been named manager of sales. Since 1956, when he joined the company, he has served as director of procurement and factory manager.

At National Vulcanized Fibre Co., . . . the appointment of D. W. Stewart to Chicago district sales manager has been announced. He succeeds J. R. Kallaher who was recently named to the newly created post of general sales manager.

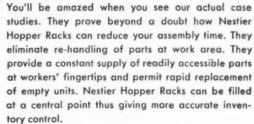
At Vickers Incorporated.... the Atlanta office will be headed by a new manager, Archie Laird. Laird was formerly sales application engineer in the company's Detroit office.



want to cut assembly time . . . increase your

production up to 50%? . . .

install NESTIER HOPPER RACKS



To find out how Nestier can work for you mail this coupon today.



NESTIER	CORPO	RATION
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Circle No. 81 on Reader Service Card for more information



For Interesting Information write

MERRILL BROTHERS

56-74 ARNOLD AVE., MASPETH, N. Y. Circle 75 on Reader Service Card

COST CUTTING IDEAS



\$ Tote Bins Save Storage Space

Victor Chemical Works moves up to 3000 pounds of phosphate in one of these aluminum tote bins. The bins amortized their cost by time savings; labor savings in loading, unloading, storing, and dumping; and reduction of container replacement. They replaced containers which could move only 300 pounds at a time. The 74 cubic foot bins are used as a shipping containers, storage containers, and discharge hoppers.

Circle 401 on Reader Service Card



\$ Storage System Protects Patterns

Thousands of patterns are stored at Andale Co. in a minimum of floor space on adjustable, interchangeable steel shelving units. The storage system saves about \$2,500 a year. Pattern loss and handling damage have been practically eliminated. About 744 linear feet of shelving provide 18,000 square feet of storage space in the company's pattern storehouse which is only 65 by 130 feet. Shelves are adjustable on 1-inch centers to accommodate any size patterns. Numbers on the shelves enable any pattern to be located and sent to the foundry in minutes. Circle 402 on Reader Service Card



\$ Long Lasting Belt Speeds Production

This Koroseal belt helps process tons of pineapple during the packing season. It's been on the job 3 years, has boosted production 10 percent by saving cleaning time. The smooth, nonporous cover is easily flushed with hot water. The belt runs 24 hours a day, 7 days a week in a bath of fruit juice. The belt is 36 inches wide, 70 feet long, and travels 40 feet a minute.

Circle 403 on Reader Service Card



S Dockboard Reduces Loading Costs

Limited dock facilities were corrected overnight at Blatz Brewing Co. The dock was too low, trucks



A-F LIVE STORAGE RACKS

Automatic warehousing ... by tape ... by card ... by push button.

Your AF Live Storage Rack can be totally automatic—even to the point where packages actually dictate their own route and "find" their own storage—then unload themselves after a specified period of time, as needed. The rack shown is unloaded by push-button remote control. One man (or woman) removes items from storage without moving from the control console. This same operation can be actuated by tape or card control if desired.

Perhaps your plant is ready for this kind of automation—or perhaps it's still a few years away. The important point is that when you invest in your live storage rack, you have purchased the basic element for your future automatic warehouse. It will give you great benefits today—whether loaded and un-

loaded by hand, by lift truck, or by other mechanical devices. Then, at a later date, it can be converted—simply by adding automatic loading and/or unloading devices.

Whatever degree of automation you specify, the fundamental advantages of live storage will be yours from the outset—orderly storage, elimination of needless walking and confusion, fool-proof first-in first-out control, space saving and many other benefits.

Our engineers will gladly survey your present storage facilities, make suggestions on cost-saving improvements and submit a proposal. In addition, we will help you determine just how automatic your system should be—for maximum benefit to you today and tomorrow. Write today for complete details.



A-F Conveyors

Custom Engineered Conveyor Systems

Packaged Conveyors—Wheel, Roller, Belt, Trolley

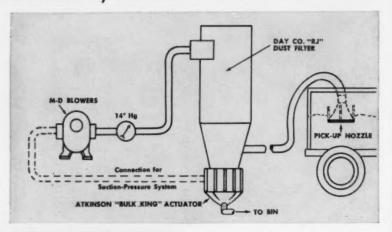
Pan and Rack Washers

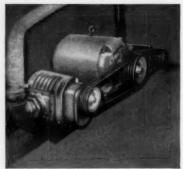
Metal Cleaning and Processing Equipment

A-F founded the package conveyor business in 1901

The Alvey-Ferguson Company, Dept. UD-12, Cincinnati 9, Ohio

NEW VACUUM METHOD Using M-D 3-Lobe Blowers Unloads 1,200 Bu. of Wheat Per Hour





Two Model 5511 M-D Blowers operating in parallel furnish 1,600 scfm, 14" Hg continuous vacuum

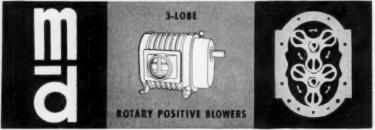
This system can easily be converted to a suction pressure system for handling flour, or granular material, by connecting the outlet side of the M-D Blowers to the rotary feeder valve, as indicated by the dotted line in the diagram above. A typical installation using two-stage M-D High-Pressure 3-Lobe Blowers, Models 5509 and 5507.5, can handle 1,700 pounds of flour per minute from trailer to storage bin. Ask about other applications of low-cost, high pressure M-D Blowers!

Atkinson Milling Co., Minneapolis, unloads 1,200 bushels of wheat per hour (that's 72,000 pounds!) from standard trailers with a new vacuum method using M-D 3-Lobe High Pressure Rotary Positive Blowers. The diagram shows the simplicity of the new system employing an Atkinson "Bulk King" Actuator, a Day Co. "R.J." Dust Filter and two M-D Blowers operating in parallel. Economies are: Only one operator needed ... low installation cost—far less than for system of lifting and dumping trailer ... lower shipping costs... elimination of dust and infestation.



Specially designed suction nozzle enables one man to unload 40 foot trailer of wheat in 35 minutes

WRITE FOR NEW FOLDER GIVING PERFORMANCE DATA
M-D BLOWERS, INC. • 100 FOURTH STREET • RACINE, WIS. • MEIrose 4-5521
A Subsidiary of Miehle-Goss-Dexter, Incorporated



Circle No. 118 on Reader Service Card for more information

COST CUTTING IDEAS

Continued

to be loaded were 2 to 14 inches above the dock level. Fork trucks with their fragile, unstable loads could not move at high speeds over short, narrow dock plates. And the high cost and loss of valuable shipping time prevented breaking up existing docks to build conventional dockboard pits. So Blatz installed semiautomatic dockboard systems (12,000 pounds capacity) in one night. The new dockboards have cut loading time over 60 percent. They are 8 feet long and 6 feet wide, and allow lift trucks to move fast even with pallet loads stacked seven cases high. The length of the dockboards keeps the operating grades down (even with trucks 14 inches above dock level) for efficient operation. The permanent nonslip mounting keeps damage and safety hazards to a minimum. The 6-foot width makes it easy to set down loads at the edges of the

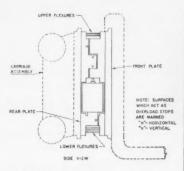
Circle 404 on Reader Service Card



\$ Strapping Saves Carloading Time

Unitizing slashed loading time at Fidler's Manufacturing Co. Use of steel strapping reduced bracing time more than 40 man-hours per carload. Before it took 3 men 2 days to brace a shipment of flush doors. Most of the time was spent applying wood bracing. Now doors are unitized by strapping into bundles of 60 to 80. The bundles are then loaded into boxcars by lift truck, and the completed load is braced with strapping. Shipments arrive damage-free, unloaded fast with mechanical handling equipment.

Circle 405 on Reader Service Card
MATERIAL HANDLING ENGINEERING



FLEXURE ACTION transmits a load weight to load cell columns.

Built-In Lift Truck Weighing Device

THE BALDWIN-LIMA-HAMILTON CORP. AND CLARK EQUIPMENT CO. have designed a weighing attachment for the C-30, C-40, CY-40, and C-50 fork lift truck models. This device consists of a flexure system that contains load cells and an instrument that interprets the electrical signal from the flexure system.

The rear plate of the flexure system is bolted onto the truck carriage; the front plate holds the forks the same as a standard fork plate. The load cell consists of a load-sensitive calibrated column of steel onto which 4 wire-type straining gages have been bonded.

Action of the flexures allows the load on the forks to compress the cells. By balancing the millivoltage output of the electrically connected strain gages, you get a digital reading in pounds.



DIGITAL READING indicates a load weight on the truck's forks.

waste motion costs you money ... speed up production traffic



with R-W Aut-o-doR

INDUSTRIAL ELECTRIC OPERATORS

R-W offers a complete line of timetested, heavy-duty Industrial Electric Operators designed to increase plant efficiency, employee comfort and safety, and eliminate heat loss in winter and conditioned air loss in the summer. R-W Electric Operators will help to speed-up plant traffic, smooth traffic flow and eliminate confusion. Smooth, automatic door operation assures fast, easy movement between departments, saves time involved in manual door operation and reduces time and cost involved in door and equipment maintenance. R-W Electric Operators open plant doors automatically as traffic approaches, hold the doors securely open, and then close the doors automatically, safely and smoothly. Eliminates door slamming and rough handling. For quick, low-cost installation, maximum performance and overall economy you can't buy a finer automatic door opener than an R-W "Aut-o-doR" Electric Operator.

Write today for your free copy of Catalog 200...it will eliminate guesswork in selecting correct operators for specific installations.



420 W. THIRD ST., AURORA, ILL. Branches in Principal Cities Circle No. 95 on Reader Service Card for more information



Gives Truck Service Tips:

Hobbs Hour Meter Talks is a pamphlet that describes many applications of the engine hour meter. In the latest issue you can find out the types of equipment that could use the meters.

A new line of dual circuit pressure switches is announced.

John W. Hobbs Corp. Circle 301 on Reader Service Card

Conveys Between Building Levels:

A folder describes the Moto Flow freight conveyor. This consists of a set of side rails on which a platform moves up and down. An electric winch provides power to move loads on the platform.

M-B Corp.

Circle 302 on Reader Service Card

How To Assemble Framing Material:

A 12-page construction handbook tells you how to use the AIM Brand slotted angle. It gives instructions for forming this framing material into storage, material handling, and maintenance structures. All accessory items, including the special cutter which makes a square cut with one stroke are illustrated.

Fabricated Materials Div., Acme Steel Co.

Circle 303 on Reader Service Card

Catalog Covers MH Line:

Here's a 48-page catalog of miscellaneous material handling equipment. It includes information about bar racks, benches, casters, carts, shelving, shipping equipment, trucks, skids, and other products.

Standard Equipment Co. Circle 304 on Reader Service Card

Shows Engine Overhaul Systems:

A 30-page brochure describes a systems concept for overhauling jet engines. This system meets the needs of commercial airlines. Features include simplified tooling, simplified assembly systems, and progressive paced processing.

Automatic Warehousing Branch, Pesco Products Div., Borg-Warner Corp.

Circle 305 on Reader Service Card

How Many Marks Does Your Plant Make?

There are 49 marking jobs in the average plant, says a new Weber brochure. It lists them, and tells how they can be done faster, easier, cheaper. Weber hand printers and label printing machines are the key. Weber stencils are cut as a carbon copy of the billing or any other typing operation. Standard typewriter. You can buy the blanks with your firm's logo die-cut.

Weber Marking Systems Div. of Weber Addressing Machine Co., Inc.

Circle 306 on Reader Service Card

Reclaim Waste Containers:

Save thousands of dollars annually with the ComptoPak, says a 6-page bulletin just released. This machine turns used corrugated containers into sheets of crimped cushioning material that's useful for unlimited packaging applications. The brochure tells how the system works, and gives several typical uses.

ComptoPak Div. Comptometer Corp.

Circle 307 on Reader Service Card

Cushioning Samples:

Learn about Tufflex cushioning materials from actual samples. The manufacturer will send them on request. There are over 100 types of Tufflex and Tufflex fabrics. They can be used for thousands of cushioning applications. They're approved for military

Dynamometer Design and Application Book:

An 81-page book has been published to show you how to use absorption type and traction-load measuring dynamometers. The book contains many on-the-job illustrations that show you how to make spring testers, measure deflection of aircraft wings, check railroad switches, motor torque, etc. with portable traction dynamometers. Included with each photograph is the pertinent engineering data. The book, titled "Dillon Dynamometers at Work in the World," can be had by sending 50¢ to W. C. Dillon & Co., Inc., P. O. Box 3008, Van Nuys, California.

packaging. You can get them in rolls or cut-to-size pieces.

Wood Conversion Co. Circle 308 on Reader Service Card

Chain Conveyor Featured:

The Vernoflex chain conveyor is the subject of a 6-page brochure. Flexibility of vertical and horizontal turns is stressed, with the standard dips and curves diagrammed. Photographs show typical installations.

Vern G. Ellen Co.

Circle 309 on Reader Service Card

Electronic Tractor:

Bulletin 586 gives you latest information on the Guide-O-Matic, the electronic industrial tractor that requires no operator. Photographs show the unit at work in various industries: foods, paper, warehousing, metalworking, freight terminals, electronics, and explosives.

Barrett-Cravens Co.

Circle 310 on Reader Service Card

Drums Made of Corrugated?

"Yessir," says a Gaylord bulletin just released. The DrumPaket is a 6-sided corrugated container you can use instead of rigid drums. Overlapping flaps on top and bottom caps lock permanently. Just slide them in place and the drum is closed without straps or tape—can only be opened with teartape provided. DrumPakets come in capacities from 2½ to 138 gallons, and hold all kinds of products. They come knocked down. Can be printed like corrugated boxes.

Gaylord Container Corp.
Circle 311 on Reader Service Card

Binds Any Size Package—Without an Operator:

Eliminate packaging log jams with the Autobinder. Fully automatic, this steel strapping machine binds any size package. No adjustments to make for different sizes. Speeds goods through packaging stations quickly, safely, cheaply. Literature describes it.

A. J. Gerrard & Co.

Circle 312 on Reader Service Card

Over 100 Cellophanes to Choose From:

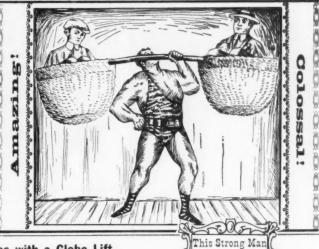
There are over 100 types of cellophane available, depending on the product and the packaging method. Marvelous

Manifestation of

Matchless Muscularity

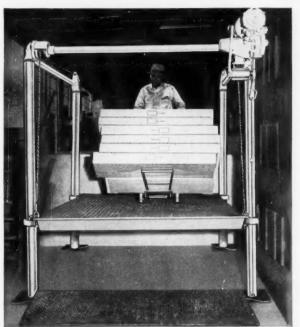
HUMAN DUMB-BELL

USED IN HERCULEAN 0116-114110



Today, any worker is a Hercules with a Globe Lift

Heavy Lifting, Quick Loading, Easy Portability are features of GLOBE ELECTRO-LOADER



With one hand on the control of a Globe Electro-Loader, a workman can lift, load or unload heavy cargo quickly and without manual effort. Because no special foundation is required, this lift can be installed anywhere . . . in shipping and receiving departments . . . beside conveyors and machines . . . alongside of raised floors . . . indoors or outside . . . upper floors . . . temporary locations . . . wherever rugged materials handling tasks are performed. Easy to install, can be quickly relocated.

For rigid permanent use, the Electro-Loader can be boltanchored to the floor or, it can be equipped with casters for fast movement anywhere in the plant. Platform is of checkered steel plate reinforced with steel beams to stand up under heavy impact loads of hand or poweroperated trucks. A wedge-shaped ramp provides a gentle upward slope for easy roll-over or, the lift may be recessed for flush platform loading.

Lifting power for the Electro-Loader is supplied by a weather-protected electric motor operating a simple cable mechanism. Adjustable automatic top and bottom limit tops, a slack cable shut off, centrifugal governor and safety brake assure accurate control, smooth operation and complete safety throughout the entire lifting

GLOBE **Electro-LOADER**

PLANTS: DES MOINES-PHILADELPHIA-LONG BEACH, CAL.

East Mermaid Lane at Queen Street Philadelphia 18, Pennsylvania



GLOBE HOIST COMPANY East Mermaid Lane at Queen Street Philadelphia 18, Pennsylvania Please send me detailed information on Globe

NAME COMPANY

ADDRESS STATE

Circle No. 47 on Reader Service Card for more information

MHE-915-EL

HARDWARE PARTS TAKE TO THE AIR AT

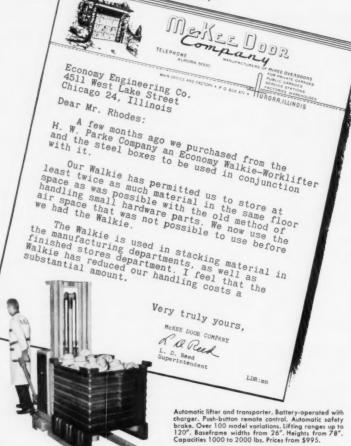
MEKEE DOOR storage space doubled in the same floor area with a

येरिटीरिटिकार

McKee Door Co., Aurora, Ill. overhead door manufacturer, recently mechanized their materials handling to combat shrinking storage space.

With the help of a Walkie-Worklifter, McKee "took to the air" . . . used air space for storing hardware parts . . . storing twice the volume in the same amount of floor area

If there is a better way for you to handle and store, chances are the Walkie is part of the plan.



Write for detailed information. Originators of materials handling equipment since 1901.

CONOMY

TAYGUNTERRING 4524 West Lake Street, Chicago 24, Illinois

Circle No. 35 on Reader Service Card for more information

. . . USEFUL LITERATURE

The right type is literally "tailor-made" to your needs. The most common cellophanes are listed in a pamphlet recently introduced. It gives their properties and principal uses, in tabular form. Also presents valuable hints that can ease your packaging problems.

E. I. du Pont du Nemours & Co., Inc. Circle 313 on Reader Service Card

Ends Stencil Brushing:

Mark stencils the roller way with Stencil-Matic. This offset-type roller, described in a bulletin that's yours for the asking, puts an end to stencil brushes or constant inking. A highly absorbent ink roller holds a full day's ink supply. Stenciling is quick, neat,

Bayberry Products Corp. Circle 314 on Reader Service Card

Warehousemen's Roster:

You can get a copy of the roster of members, 1958-59, for the American Warehousmen's Association, Merchandise Div. It lists names, addresses, areas, telephone and TWX number of menibers and executives to contact.

American Warehousemen's Association, Merchandise Div.

Circle 315 on Reader Service Card **Explains Conveyor Systems:**

A 6-page bulletin illustrates and describes a complete line of Unibilt power and gravity conveyors. It explains "assemble-yourself" construction and outlines details of engineering services. The bulletin includes a sketch of a typical 2-floor conveyor system.

Conveyor Specialty Co. Circle 316 on Reader Service Card

Handling Equipment Catalog:

A 12-page catalog describes specialized material handling equipment. There are sections on adjustable dock ramps, automatic pallet loader, automatic pallet dispensers, pallet load compressor, hydraulic lift table, and special purpose machinery (such as automatic drum pallet loader, cantilever bridge lift, vertical bridge lift).

Beacon Machinery Co. Circle 317 on Reader Service Card

Information on Transmission Belting:

This 8-page booklet gives information on this company's power transmission belting made of polymer and chrome tanned leather. The catalog contains sections on significant application, a description of the belt, selection of the proper belt type, tensioning and maintenance, and bearing load reduc-

Extremultus, Inc.

Circle 318 on Reader Service Card

Fact File Folder on Packers:

A Fact File Folder on Stoker Packers is yours for the asking. It contains 10 data sheets on all current models for valve and open mouth bags and drums. The entire kit comes in an attractive folder to keep this valuable information handy at your fingertips.

H. L. Stoker Co.

Circle 319 on Reader Service Card

High Speed Bagging and Weighing:

Bulletin No. 210 shows the Bemis Feeding and Filling Machine and Trim-Weigh Scale in action. It explains operational performance and engineering data on this fast, accurate bagger and weigher. High speed packing in 2-lb., 5-lb., and 10-lb. bags—automatically. Average weight tolerance plus or minus two-tenths of an ounce.

Bemis Bro. Bag Co.

Circle 320 on Reader Service Card

Tells about Truck Features:

A six-page brochure has been published about the CY-20, a 2,000 pound capacity, pneumatic tire, gas-powered fork truck. Major components are described and more than a dozen operating features of the unit are illustrated. Tables and graphs indicate grade and capacity ratings and upright dimensions.

Industrial Truck Div., Clark Equipment Co.

Circle 321 on Reader Service Card

Need Conveyor Data?

Catalog 80 gives you details on the series L-M horizontal and inclined belt conveyors. It describes the complete line of L-M stock components, as well as describing how they can be customized to meet the requirements of any store, warehouse, or factory for a light-medium conveyor system.

The E. W. Buschman Co.

Circle 322 on Reader Service Card

How to Buy Adhesives:

There are 23 basic things you should know about your needs before buying adhesives. A recently introduced pocket-size folder lists the 23 questions you should ask yourself in order to get the best adhesive for your operation. This useful guide should be in all packaging departments.

The Arabol Mfg. Co.

Circle 323 on Reader Service Card

Container of the Future— Available Now:

A 4-page folder describes the Adapto container system, for integrated shipping by rail, highway, and ship. Adapto containers are master containers that



Circle No. 129 on Reader Service Card for more information

Ask Standard : cut costs | conveyors

how to cut costs with



Dallas department store slashes time lag between receipt and sale of goods

In 1955, Titche-Goettinger modernized their receiving and shipping departments with Standard Roller Conveyors. As in so many other cases, the move is paying off handsomely - in terms of simplifying handling and storing, in time and manpower savings. Based on two years' operation, here's Traffic Manager L.V. Nicewarner's evaluation...

> There has been absolutely no maintenance problem, and the equipment will undoubtedly be in as good condition ten years from now as it is today. And through its use, we've been able to implement a more orderly procedure for the careful checking and marking of incoming merchandise and reduce the time lag between the receipt and sale of goods. We're well pleased with the equipment and its installation.

> > Traffic Manager



Call the Standard engineer listed in your classified phone book or write direct. Ask for Bulletin 68, address Dept. A-12.

It pays to put Standard's 50 years of conveyor building and application experience to work in your business...get a system job-tailored to your specific needs. STANDARD CONVEYOR COMPANY. General Offices: North St. Paul 9, Minnesota. Sales and service in principal cities.



Circle No. 101 on Reader Service Card for more information

. . . USEFUL LITERATURE

can be shipped anywhere in the world without reloading or handling the cargo. They are rugged and lightweight, and can be sealed completely. They can be handled on any flat bed truck, rail car, or ship's hold.

American Car & Foundry Div. of ACF Industries, Inc.

Circle 324 on Reader Service Card

How to Improve Markings:

Here's a pocket-size folder that will tell you how you can save money, speed shipments by marking packages with stencils. Covers the complete Marsh line including stencil cutters, boards, brushes, and inks. Gives useful tips for the shipping room.

Marsh Stencil Machine Co.

Circle 325 on Reader Service Card

Vibrator Data Sheet:

A data sheet has been published on the small V-2 electromagnetic vibrator. This unit is designed to vibrate diminutive hoppers and tracks and chutes of processing, assemblying, and packaging machines. The sheet gives complete listing of dimensions and specifications of three standard models.

Syntron Co.

Circle 326 on Reader Service Card

Tractor Shovel Data:

This 6-page brochure describes the company's Model 104 Trojan tractor shovel, a 11/4-cubic yard unit. Complete specifications are given along with a list of standard and optional equipment.

Contractors Machinery Div., The Yale & Towne Manufacturing Co. Circle 327 on Reader Service Card

Data on Automatic Cartoning **Machinery at Your Fingertips:**

Automatic cartoners, packaging machines, bucket feed cartoners, and carton glue sealing machines are the subject of a booklet just introduced. Includes specifications. A useful reference for packaging men.

Container Equipment Corp.

Circle 328 on Reader Service Card

Processing Equipment:

An eight-page condensed catalog, Bulletin 200, on processing equipment and systems is now out. The bulletin covers equipment for size reduction, size classification, mixing and blending, material handling, pelleting and densifying, pulp refining and digesting. Size ranges, connected hp, and applications for each type of unit are included.

Sprout, Waldron and Company, Inc. Circle 329 on Reader Service Card

Peel Coat Protects Your Product:

Peel-It Weatherguard is the subject of a folder just published. This peelable plastic weatherproof coating comes in liquid form; can be sprayed, brushed, or dipped on any non-porous surface. When it dries it becomes a non-enflammable, tough, and flexible coating. It is quickly removed by hand stripping when desired. It leaves no oily residue, discoloration, or odor.

Harco Chemical Co. Circle 330 on Reader Service Card

Uniform Magnetic Field:

An 8-page color bulletin describes the Indox V Ceramic Magnet Drum Separator, The ceramic material used in this separator produces a uniform magnetic field up to 40 percent more powerful than in ordinary permanent magnet units, the company states. The bulletin simplifies selection (three models offered) by means of detailed specifications and dimensions.

Stearns Magnetic Products Circle 331 on Reader Service Card

Is Your Cushioning Obsolete?

Rubberized curled hair is available in protective pads tailored to fit your product. Resilient, durable, and in any shape, thickness, or density. The answer to many packaging problems where other cushioning materials failed. Literature available.

Janesville Cotton Mills Circle 332 on Reader Service Card

Directionally Operated Controls:

Circular 34-H is a 4-page bulletin explaining features and operating details of this company's Roto-Cam Control. The controls are used on electric "walkie" type materials handling trucks.

Lewis-Shepard Products, Inc. Circle 333 on Reader Service Card

Forming and Drawing of Thermoplastics:

This 4-page bulletin describes the company's past achievements and its capabilities in the field of vacuum forming thermoplastics. The firm is equipped to produce various formed plastic parts, also supplies and assembles backings, cord sets, electrical components, in suitable packaging, to suit customer requirements.

Gregstrom Corporation Circle 334 on Reader Service Card

Personnel Elevator Can Be Moved Anywhere:

Catalog No. 852 describes a personnel elevator that can be packaged, moved



Tailored to your dock. Magcoa field men forward exact specifications. factory individually fabricates to your needs. All equipment is guaranteed to fit.



Problem solving is our specialty. A competent staff of experienced engineers plan the best, most economical equipment and handling methods for your operation.

Get the benefit of personalized service...cost-cutting ideas!



Narrow dock problem, for example, is solved in this case with a Magcoa Flared Dockboard. The flare design eliminates sharp right angle turn . . . speeds loading.



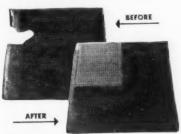
Or, own a portable dock. A Magcoa Portable Yard Ramp enables you to load from ground level anywhere in your yard. Light, easy to move . . . one man handles.



Magcoa Service Centers, throughout the U.S. and Canada, offer you modern facilities...fast, competent assistance to help solve your handling problems.



Materials Handling Specialists give you on-the-spot assistance . . . valuable technical information on latest developments of lightweight handling equipment.



Magcoa Dockboards don't wear out. If an accident does occur (a switch engine did the above) Magcoa Factory Service

makes your board like new. Ask about it. Circle No. 70 on Reader Service Card for more information

	AMERICA Materials Handling Di
n	lageoa / East Chicago 1, Indian
	Representatives in principal citi
	Send special Dock Equipment File and address of local service center, e and Title
Com	pany
	pony

A COMPLETE LINE OF GENERAL PURPOSE BELT CONVEYERS engineered and standardized by

MATHEWS



A reversible General Purpose Belt Conveyer serving parallel roller conveyer storage lines.

THESE General Purpose Belt Conveyers are furnished in a wide range of belt widths and section lengths. They can be assembled easily, for all parts are standardized and furnished from stock. The conveyers have several features which make them especially practical for the average package handling problem. The drive unit may be located at the end, or at any convenient point beneath the conveyer. End roller assemblies, takeups, and three-pulley devices are all standardized and easily installed.

Floor and hanger supports have a wide range of adjustment, and are especially convenient in situations where conveyers must be arranged to meet production requirements.

Write for Bulletin G.P.53 and Catalog 856 today.





MATHEWS CONVEYER COMPANY

CANADIAN DIVISION . MATHEWS CONVEYER COMPANY, LTD., PORT HOPE, ONTARIO.

ATHEWS
Over Jifty Years of Leadership in Mechanized Handling

Circle No. 74 on Reader Service Card for more information

. . . USEFUL LITERATURE

and set up anywhere to lift men and materials. Standard models may be erected up to 250 feet, and will lift 8 men or 2,000 pounds at a rate of 55 feet per minute. Complete drawings and specifications are given in the catalog.

Hawkeye Products Corporation

Circle 335 on Reader Service Card

Aluminum Dock Board Data:

This 4-page folder gives information on special aluminum alloy dock boards. Seven types in 15 sizes of dock boards are available from standard stock. Length, width, capacity, weight, and catalog numbers are given for the six basic types of boards made.

F. H. Langsenkamp Company Circle 336 on Reader Service Card

Adjustable Stock Guiding Device:

A 4-page bulletin is available explaining this company's adjustable stock guiding device. Two sizes are made, Model 48-24 (48 x 24 inches) and Model 72-24 (72 x 24 inches). Capacity is 4000 lbs. on a stock table. Called the Ex-E-Feed strip-stock feeding table, the unit has a full 90 degree angular adjustment.

Bowling Green Manufacturing Co. Circle 337 on Reader Service Card

No Room for Strapping Tools?

Suspend them, says a booklet from Signode. And it tells how. New accessories increase operator efficiency by suspending the strapping tools in all conceivable positions, as well as adding portability. All requirements and operating specifications are described.

Signode Steel Strapping Co. Circle 338 on Reader Service Card

Accumulating Tables:

Custom-built accumulating tables, stationary and rotary type, and custombuilt conveyors are described in this bulletin.

Keenline Equipment Corp.
Circle 339 on Reader Service Card

Cartoning Manual Available:

Mechanical Cartoning Equipment Manual is available to packaging designers, consultants, and engineers. It provides a single source of cartoning information. Includes specification pages as well as up-to-date data on equipment and techniques; contains 120 pages,

> Folding Paper Box Association of America

Circle 340 on Reader Service Card

Non-Skid Abrasive Ladder Rungs:

A 4-page brochure describes the uses and advantages of Relgrit non-skid abrasive ladder rungs which, the company states, last as long as steel and provide safe footing on ladders even when they are wet or oily. Complete data with illustrations will help user to determine his own applications.

Reliance Steel Products Co.

Circle 341 on Reader Service Card

Cutting Costs:

A new brochure, "100 Ways To Cut Material Handling Costs," is a special research report giving 100 tips on equipment, design and construction, conveying, storage, delivery, unloading, safety and the administration of a warehouse.

Manpower, Inc.

Circle 342 on Reader Service Card

Skin Packaging Is Fully Automatic:

A 4-page bulletin describes the Comet Quick-Pak, a high-speed low-cost skin packaging machine, It is designed for fully automatic operation. All operations are in one unit.

Comet Industries

Circle 343 on Reader Service Card

Make Layouts with Tape:

A 32-page catalog describes many products in the Chart-Pak system. This system uses precision slit and printed pressure-sensitive material in tape, rectangle, and sheet form for layouts, charts, graphs. Of special interest to the material handling man are the plant layout tapes and those representing belt and roller conveyors and monorails.

Chart-Pak, Inc.

Circle 344 on Reader Service Card

Samples on Request:

Jet-Pak bags are now available in sizes and styles for premiums and novelties. They cushion, insulate, and are water-resistant. Quick and low cost. Mill representatives will provide you with samples for your product.

Jet-Pak, Inc.

Circle 345 on Reader Service Card

Lift Tables:

This isoscoler balletin details the La result of the company's three standard size lift tables. Capacities of the three tables are: 2000, 4000 at 0.000 pounds.

Clark-Aiken Company

Circle 346 on Reader Service Card

(Continued on page 92)



Standard Sturdi-Bilt rack is laid on its side for vertical storage of sheet metal. Slide-out metal pans were fashioned for shelves,

Vertical or horizontal storage with one simple system—STURDI-BILT

Farnsworth Electronics Company of Fort Wayne, Indiana, a division of International Telephone & Telegraph Corp., uses a variety of metal stock in the manufacture of electronic components. To efficiently handle and store all the odd shapes and sizes was always a problem.

Adjustable, strong Sturdi-Bilt standard frames and support bars provided the perfect answer for the rod, tube and bar stock. For storing the sheet metal, Farnsworth took the same basic rack and laid it on its side. Simple pans were made for shelves.

If stock requirements change, so do the racks. That's the beauty of the Sturdi-Bilt system. Standard, prefabricated frames and bars come $97\,\%$ assembled—fit together without skilled labor, tools, welding or bolting. They can be adjusted, changed, expanded—used over and over without waste.

Why not investigate this space-saving storage system for your needs? It may provide some cost-saving answers for your storage problems.

97% assembled Float wedge construction eliminates nuts, bolts, tools, welding or special labor.



Simply insert
 Sturdi-Bilt
 Wedge Lock . . .

U.S. Patent Nos. 2760650, 2815130



2. . . . into the slots in the factory pre-fabricated upright frame . . .



3. . . . and lock to the horizontal safety support



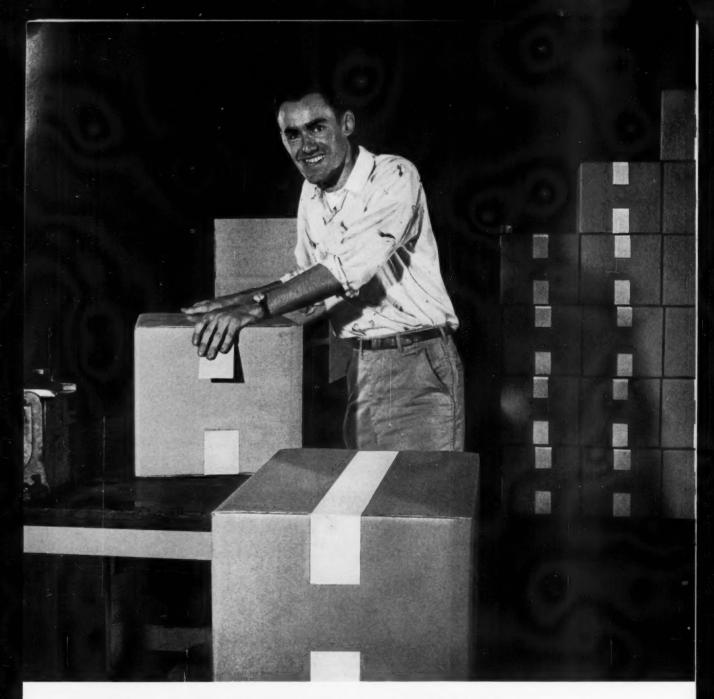
Want more details?

Attach this coupon to your letterhead, or write:

STURDI-BILT F-128
Material Handling Division

Union Asbestos and Rubber Company 332 So. Michigan Ave., Chicago 4, Illinois

Circle No. 104 on Reader Service Card for more information



"With 2-strip sealing I can seal 3 times as fast as I used to"

Under Rule 41 railroads have now approved the use of 2 strips of reinforced tape for sealing corrugated boxes. Cartons are sealed on a production line basis when you seal with Sisalkraft Sealing Tape. Only 2 strips need be used. You get time-savings, labor-savings and a secure closure every time.

Whether your Shipping Room seals 100 or 1,000 containers daily, it will pay you to write for more facts about the advantages of reinforced sealing tape. American Sisalkraft Corporation, Attleboro, Massachusetts, manufacturers of tape stock for the Gummed Paper Industry.

SEALING TAPE



Give The People The Facts . . .

There's a big job of public relations to be done by our industry. And it's urgent! We've got to show clearly and often what better material handling means to everyone. If we don't, we can expect workers to have information from sources that are uninformed or intentionally passing out distorted facts.

Books and magazine articles have shown in a dozen ways how mechanization benefits the economy. But how many people see these benefits for themselves? It seems we haven't put it over where it counts—in the local community, in the home. Unless more informed people take on this job, we're going to find an increasingly hostile working force. It will be tougher and tougher to sell a better system to the men who must make it work.

A number of companies have done outstanding jobs in giving facts to their employees and their communities. General Electric and DuPont are two easily remembered. But we think a concerted industry effort is needed to produce a constant flow of information to newspaper columnists and others who reach audiences of millions. Most of them will welcome such an effort. And it will minimize the effect of those who work just to attract attention or arouse emotions.

Which Will You Believe?

Let's summarize a recent syndicated article by a well respected daily writer. It said that employment in factories will probably never again be as high as it was before the recent recession, that unemployment is in a dreadful uptrend. The basic reason for this view was that new plants, mechanization and automation can produce enough to satisfy our needs with lower factory employment. It suggested that dire things will happen to the economy unless the nation does something to halt the malaise and bring back high employment. One cure that labor will certainly make a big issue in 1960 will be a shorter work-week, the writer noted. Also suggested was a national program to help distressed areas by relocating and re-educating young workers while helping older unemployed people who can't be relocated. The article concluded that, while business continues on the upswing, there will be millions of fine workers cruelly wasted.

Now let's see what DuPont told its employees in its excellent company publication. In 1976, when the country will be 200 years old, it could face one of its greatest problems. Simple arithmetic shows that, if trends of the past 80 years are continued, a population of 216 million will then demand twice the goods and services available today. Yet the work force will be only about a third larger. This means that, at today's rate of output, we'll be able to produce only about 70 percent of the demand. On the basis of time, there would be a shortage of 76 billion man-hours of labor in 1976. This data is supported by charts and graphs. Three choices are indicated: (1) Work 11.5 hours per day, or 57 per week; (2) recruit more labor among students, retired persons and housewives; or (3) increase individual output. The latter, this article concludes, is the answer—through utilization of every technical advance, every ingenious invention, every new tool to boost productivity.

Which one do you believe? If you go along with DuPont, we suggest you work with your societies and associations to see that the true facts get into the best channels of public information—on a planned, continuing basis.

Ed Leighten Executive Editor

61

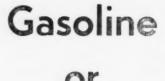
Here are some factors that could determine the answer when you ask the question: what type of fuel should I use in my engines . . .

OTHER 21%

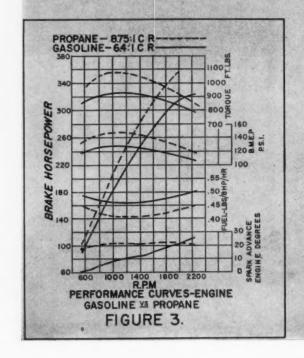
OTHER 21%

NITROGEN 25%
CARBON FUEL

FIGURE I.



by Howard A. Reinhart*



N INTERNAL COMBUSTION ENGINE burns fuel and air (oxygen) inside of cylinders. This kind of engine is called a heat engine, and its fuel—gasoline or propane—contains a certain number of heat units per pound. For proper burning, you need the right proportions of air and fuel (A/F ratio).

In combustion, the oxygen from the air combines with the carbon and hydrogen from the fuel. Figure 1 shows the division of air and how hydrocarbon fuels are arranged.

The nitrogen in the air does not take part in the combustion reaction. It does absorb some heat so that heat energy is spread thin through a large quantity of nitrogen and combustion products.

All hydrocarbon fuels—gasoline-butane, propane, and propylene have within 3 percent of the same heat value measured in British Thermal Units (B.T.U.'s) per pound.

Heat units, even on a pound basis, do not indicate

*Zenith Carburetor Division, Bendix Aviation Corp.

power or thermal efficiency. Figure 2 shows the factors that influence power and thermal efficiency.

Although at a given thermal efficiency, the work available from a given volume of fuel depends on the B.T.U.'s per gallon, the power which can be developed depends on the heat of combustion of unit volume of the fuel-air mixture used (assuming correct mixture). Due to the greater vapor density of gasoline and the difference in the amount of air required for complete combustion (15.11.1 for C_8H_{18} and 15.65 for C_3H_8) energy per unit volume of mixture differs for gasoline and propane.

The power will also be influenced by the ratio of volume of the mixture after and before burning. This ratio is slightly greater than 1.0 for most liquid fuels and petroleum gases and slightly less than 1.0 for most gaseous fuels other than petroleum.

If these conditions exist:

- 1. There is variable heat input to the manifold so that mixture temperatures are equal.
 - 2. Compression ratios are equal and below the

Comparison of Gaso	FIGURE 2. Jine & Propan	e Characteristics
	Gasoline (C ₈ H ₁	Propane (C ₃ H ₈)
 Mechanical equivalent of the heat of combustion of the cor- rect mixture per unit volume of charge (60°F —760 mm,) 	per std. cu. in.	41.63 ft. lbs. per std. cu. în.
2. Volume ratio of products of combustion and inlet mixture	1.058	1.044
3. Highest useful compression ratio	Depends on engine design and octane #	Depends on engine design

127.8 B.T.U. per 1b.

= 47.25 mols

100% or less

None

100%

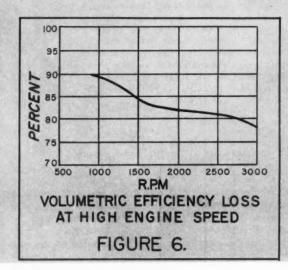
73.6 No

% Per mol of Propane
12.4 CO₀ = 3 Mols
14.0 H₂O = 4 mols

= 18.87 mols 73.0

11.6

6:1 C/R WORK 28% COOLING EXHAUST MEDIUM 33% 33%
CIRCLE = 100% HEAT VALUE
IO:1 C/R WORK 325% COOLING MEDIUM 31.5% FRICTION 36%
HEAT BALANCE-ENGINE TWO COMPRESSION RATIOS FIGURE 4.

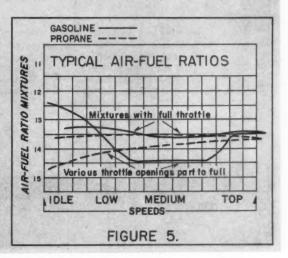


4. Heat subtracted from mixture

5. Effective volatility (% vaporized when inlet valve closes)

Composition of products of Permol of gasoline

combustion in the correct mix- $CO_3 = 8$ mols ture $H_2O = 9$ mols



highest useful compression ratio for the lower octane number fuel.

3. The liquid fuel is completely vaporized.

4. The chemically correct mixture is used with both fuels.

Then the relative power obtainable with propane and gasoline is directly proportional to the products of Item 1 and Item 2 in Figure 2. On this basis propane should develop 2.4% less power.

$$\frac{41.63 \times 1.044}{42.10 \times 1.058} = 97.6 \text{ percent}$$

Calculation of several gaseous and liquid fuels using Item 1 and Item 2 of Figure 2 give the following com-(Continued on page 117)

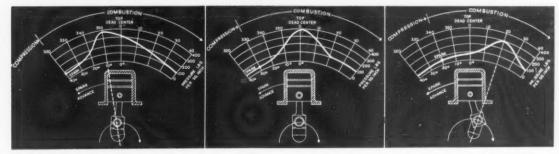


FIGURE 7. The effects of early timing (left), correct timing (center), and late timing (right), using specific engine and fuel. The fuel must be ignited at the correct time so that entire charge will burn.

The MHE Conveyor Series



Here is the first in a series of articles designed to give material handling engineers important technical information on all types of conveyors. It covers both flat and troughed belt conveyors. Following articles will report on elevators and boosters; portable and telescopic conveyors; en masse and flight conveyors; trolley and tray conveyors; roller and wheel conveyors; screw and spiral conveyors; reciprocating, vibrating, and oscillating conveyors; pneumatic and pneumatic tube conveyors; chain, chain drag, and push bar conveyors; floor and slat conveyors; apron and bucket conveyors. Watch for them in coming issues of MATERIAL HANDLING ENGINEERING.



"Conveyors form the backbone of continuous flow production. During the past 15 years 83½ billion worth of conveyors have gone into service. Most have returned their initial cost 3 or 4 times over. One reason:

The muscle generated power of unskilled material handling labor costs about \$15 per hphour, while the same amount of electric energy to power conveyors costs two cents or less."

—R. C. Sollenberger, executive vice president, Conveyor Equipment Mfrs. Association. W ERSATILITY and simplicity are combined in belt conveyors. You can load material on them either manually or automatically at the end or any other place on the conveyor. You can take it off by hand, discharge it over the end of the conveyor, and deflect or trip it from the belt anywhere along its run.

Any belt conveyor is composed of a drive, a takeup, and intermediate sections. Each is designed to perform a specific function. There is a lot of standardization in conveyor parts because they always do similar jobs. Belt conveyors are either standardized or engineered. But you need a lot of engineering data to select the best standard conveyor, and often many standardized parts are used in engineered conveyors.

When you are designing a complete new handling system you can generally arrange to use a standard conveyor. If you are altering an existing handling system a conveyor will probably have to be engineered to meet your requirements. But check to see if you can get a standard conveyor to do the job, because you can probably

get quicker delivery and it may cost you less.

Watch carefully over the erection of a belt conveyor. The drive and the takeup shaft (which maintains the belt tension) must be exactly in line, and the return rollers must be adjusted so that the belt runs true. Proper adjustment is important—too much tension wastes power, and a loose belt may catch and tear.

Troughed Belts

You can move all the bulk material you want and more with troughed belts. Some conveyors handle up to 8,000 tons an hour. Equipment is now available that will handle more material than needs to be moved on any job. Experiments are being made with belts 105 inches wide that run at speeds of 1,000 to 1,400 fpm.

Long distance belt conveying started in 1929 when a conveyor system moved Denny Hill from the heart of Seattle's business district. Over 5 million yards of earth were moved in about 300 days. The champion of all cross-country belt conveyor systems was

Conveyors

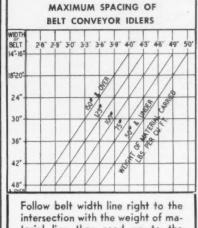
by Byron E. Kennel Associate Editor

used by Henry J. Kaiser Co. It traveled 9.6 miles of rugged country, carried 12 million tons of sand and gravel to Shasta dam in 4 years.

One reason for the increasing use of belts in long distance moving is that they go up grades of 30 percent compared to the 10 percent grade maximum for most trucks and the 3 percent grade of railroads. Long distance conveyors are easier to build now that improved textile and steel cord belts have increased belt strength 4 to

Capacities in the chart at right are conservative. The lump sizes listed can be handled in cases of incline loading and loading in other than the direction of belt travel without excessive spillage. You can increase capacities 20 percent if you meet the following conditions: I. Lump sizes are held to less than 50 percent of those shown. 2. Loading area is level or has less than an 8 degree slope. 3. Load flows in the same direction and at the same speed as the belt. 4. Properly designed chute and skirtboard is used to form and center a load on the moving belt.

MAXIMUM ANGLES FOR CONVEYORS Belt Material Type of Belt Plain Cleater -Mine Run Bituminous Coal-27° 30° 27° 28° 30° 30° 30° 30° 18° 35° -Lump 159 18° Egg -Stove -Chesta 18° 15° 20° 18° 18° Anthracite Coal-Pea-Barley ... -Lump ... -Screened Stone — 1" Send and Grevel Fine Dry Sand Fine Wet Sand ... Silica Dry Sand ... Foundry Sand ... Laste — Moist ... 20° 20° 15° 25° 22° 23° 30° - Loose — Loose Wet Concrete Dry Batch Aggregate Ag. Lime Stone Bulk Cement Cinders — fine Stone Granel 18° 27° 22. 30° 27° 30° Slag grannal Fertilizers (Nitrates) 18" 20°



Follow belt width line right to the intersection with the weight of material line then read up to the troughing idler spacing. Figures are a guide, can be varied slightly.

CAPACITY OF TROUGHED BELT CONVEYORS CAPACITY IN TONS (2000#) PER HOUR-STANDARD 20° TROUGHING IDLERS

D 1.	Maxim	um Lumps	Material	terial Speed in Feet Per Minute									
Belt Width	Sized	Unsized	Weight Cu. Ft.	100	250	350	400 -	450	500	550	600	650	700
14"	2"	21/2"	30	9	20	30	35	40	45				
			50	15	40	50	60	70	75				
			100	30	75	105	125	135	155				
			150	50	125	175	200	225	250				
			200	65	160	230	245	290	310				
18"	3"	4"	30 50	15 30	40 75	50 105	65 120	70 135	80 150				
			100	55	135	190	215	250	270				
			150	80	200	280	320	360	400				
			200	105	260	370	430	470	540				
20"	4"	6"	30	20	50	70	80	90	100	110			
			50	35	85	125	145	155	180	190			
			100	70	175	245	290	315	360	385			
			150	110	275	385	430	495	540	600			
			200	145	360	510	575	655	720	800			
24"	5"	8'	30	30	75	105	120	135	150	165	180		
			50	50	125	175	200	225	250	275	300		
			100	100	250	350	400	450	500	550	600		
			150	150	400 500	500 700	600 800	675 900	750 1000	825 1100	900 1200		
	70.11		200	200	_	-		225	250	275	300	200	350
30"	7"	14"	30	50	125	175	200	360	415	440	480	325 520	581
			50	80	200 415	280 580	330 669	740	825	910	990	1,070	1,160
			100	165 250	625	875	990	1130	1240	1370	1,490	1,620	1,740
			150 200	330	825	1160	1300	1480	1660	1810	1,980	2,150	2,320
36"	9"	18"	30	75	190	265	295	335	370	410	440	485	520
30	9	1.0	50	125	315	440	490	560	615	690	740	810	860
			100	245	615	860	980	1100	1230	1350	1,470	1,590	1,720
			150	370	925	1300	1470	1660	1840	2040	2,210	2,400	2,580
			200	490	1230	1720	1970	2200	2460	2690	2,950	3,180	3,440
42"	11"	20"	30	105	260	370	420	470	525	575	630	685	735
			50	175	440	615	700	790	875	960	1,050	1,380	1,236
			100	350	875	1230	1400	1580	1750	1930	2,100	2,280	2,450
			150	530	1330	1860	2120	2390	2650	2920	3,180	3,450	3,710
			200	700	1750	2450	2800	3150	3500	3850	4,200	4,550	4,900
48"	14"	24"	30	140	350	490	550	630	690	770	830	910	960
			50	230	575	805	920	1030	1150	1260	1,380	1,490	1,610
			100	460	1150	1610	1840	2070	2300	2530	2,760	2,990	3,220
			150 200	690 920	1720 2300	2420 3220	2760 3680	3100 4140	3450 4600	3790 5060	4,140 5,520	4,480 5,980	4,830 6,440
	15"	2211					745	830	930	1020	1,120	1,200	1,300
54"	15	28"	30	185	465 775	650			1560	1700	1,870	2,010	2,180
			50	310		1090 2170	1240 2480	1390 2790	3100	3410	3,730	4,030	4,34
			100	620 920	1550 2300	3220	3730	4140	4660	5060	5,590	5,980	6,530
			150 200	1250	3120	4380	4970	5620	6220	6870	7,460	8,120	8,70
60"	16"	30"	30	235	590	820	940	1050	1180	1290	1,410	1,530	1.65
00	10	20	50	390	975	1370	1570	1750	1970	2150	2,360	2,530	2,75
			100	785	1970	2750	3140	3530	3930	4320	4,710	5,100	5,500
			150	1180	2950	4130	4710	5310	5890	6490	7,070	7,670	8,250
			200	1570	3930	5500	6280	7060	7860	8640	9,430	10,200	10,990
72"	17"	32'	30	340	850	1190	1360	1530	1700	1870	2,040	2,210	2,38
-			50	570	1410	1980	2260	2540	2830	3110	3,390	3,670	3,966
			100	1130	2830	3960	4520	5090	5650	6220	6,780	7,350	7,910
			150	1700	4250	5950	6800	7650	8500	9350	10,200	11,100	11,900
			200	2260	5650	7910	9040	10170	11300	12430	13,560	14,690	15,820

Belt Conveyors . . .

10 times. Belts can be made longer and transfers eliminated. By using the new drive mechanisms convevors can be built to follow the contour of the ground (earlier conveyors often had to be broken into sections according to the lay of the land). And when conveyors run downhill they can be used to generate usable power.

There are other reasons why conveyor belts are cheap to operate. They need less power than other forms of transportation because they have a high ratio of live to tare weight. Conveyor parts are long lasting and the labor cost of replacing them is low. And the cost of inspection and attendance is low. So is loading and unloading. Most important is the excellent safety record per ton handled.

Picking a Troughed Belt

A narrow belt at high speed or a wide belt at a slower speed may each have the capacity to do your job. Which should you choose? Several considerations will affect your decision. For example, the lump size of the material. There is a maximum lump size that can be carried for each width of belt. Cost of belt idlers and machinery will usually favor the narrower belt. However, the narrow belt may have to be thicker to carry the load. And it is harder to load on narrow belts at the high speeds they require. The faster running belts wear out faster because they pass the pulleys and loading point more often. Heavy, sharp, or abrasive material should be handled at lower speed to save wear on the belt at the loading point. Easily broken material, such as coke or lump bituminous coal, should be carried at relatively low speeds to minimize breakage.

You can't run narrow belts as fast as you can wide ones, because the narrow ones are more apt to spill and are harder to train and to load. But no matter what speed you use make sure that the belt carries its full load, otherwise the life of the belt will be shortened compared to the tonnage hauled.

If you plan to expand your handling system later you may be better off with a wider belt. The additional cost of the conveyor will be much less than proportionate to the increased carrying capacity.

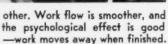
Application of Flat Belts



PAPERWORK goes faster when file clerks don't have to carry forms from one operation to an-



PACKAGES are raised by a booster belt. The rest of the system uses rollers which need no powergravity moves the packages along.





NAILS defy gravity with the help of magnetic force and an assist from this grooved conveyor belt.



CANS go around the corner without various sizes becoming mixed as metal framework guides each row of cans onto the cross belts.



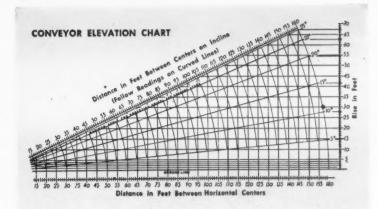
BALES of scrap metal can't hurt a hinged steel belt even when they are diverted from the conveyor. The belting can be run in liquids.



How to Save on Belts

The thickness of rubber needed to cover the fabric plys of the belt depends on the belt's length. Longer belts require less thickness because the wear-inducing loading impact is spread over more area. Generally very thin covers can be used for light nonabrasive material such as grain, 1/16 to ½ inch thicknesses of rubber are usually enough when sand or coal is being handled, and 3/16 to ¼ inch covers are needed for sharp crushed rock or ore.

You need belts with thick covers if the loading impact is heavy. But you can eliminate the need for thick covers on a long distance conveyor belt by using an acceleration or speed-up belt to take the loading impact. By using an extra heavy belt on a short acceleration conveyor you can concentrate all the wear of loading on one expendable belt. Because the head pulley is small, the drop to the main conveyor is short. Scuffing is reduced since the material flows from the



Horsepower Required to Convey Any Material Horizontally

Tons Per Hone	CENTER TO CENTER LEMETH IN FAET													
	50	100	158	200	250	300	400	500	600	700	800	1000	1200	1400
50	.3	.4	.5	.f	.6	.7	.8	1.0	1.1	1.3	1.4	1.7	2.0	2.3
100	.6	.8	.9	1.t	1.2	1.4	1.7	2.0	2.3	2.6	2.9	3.5	4.1	4.7
150	.9	1.1	1.4	1.8	1.8	E.B	2.5	0.0	3.4	3.9	4.3	5.2	6.1	7.0
200	1.2	1.5	1.8	2.1	2.4	2.7	3.3	1.8	4.5	5.2	5.8	7.0	8.2	9.4
250	1.5	1.9	2.3	2.7	3.0	3.4	4.2	4.9	5.7	6.4	7.2	8.7	10.2	11.7
300	1.8	2.3	2.7	3.2	3.6	4.1	5.0	1.3	6.8	7.7	8.6	10.5	12.3	14.1
350	2.1	2.7	3.2	3.7	4.2	H	5.8	6.9	8.0	9.0	10.1	12.2	14.3	16.4
400	2.4	3.0	3.6	4.2	4.8		6.7	7.9	9.1	10.3	11.5	13.9	16.4	18.8
450	2.7	3.4	4.1	4.8	5.5		7.5	8.9	10.2	11.6	13.0	15.7	18.4	21
500	3.0	3.8	4.5	5.3	6.1	6.8	8.3	9.8	11.4	12.9	14.4	17.4	20	23
550	3.3	4.2	5.0	5.8	6.7	7.5	9.2	10.8	12.5	14.2	15.8	19.2	22	26
600	3.6	4.5	5.5	6.4	7.3	8.2	10.0	11.8	13.6	15.5	17.3	21	25	28
650	3.9	4.9	5.9	6.9	7.9	8.9	10.8	12.8	14.8	16.7	18.7	23	27	31
700	4.2	5.3	6.4	7.4	8.5	9.5	11.7	13.8	15.9	18.0	20	24	29	33
800	4.8	6.1	7.3	8.5	9.7	10.9	13.3	15.8	18.2	21	23	28	33	38
900	5.5	6.8	8.2	9.5	10.9	12.3	15.0	17.7	20	23	26	31	37	42
1000	6.1	7.6	9.1	10.6	12.1	13.6	16.7	19.7	23	26	29	35	41	47
1100	6.7	8.3	10.0	11.7	13.3	15.0	18.3	22	25	28	32	38	45	52
1200	7.3	9.1	10.9	12.7	14.5	16.4	20	24	27	31	35	42	49	56
1300	7.8	9.8	11.8	13.6	15.8	17.7	22	26	30	33	37	45	53	61
1400	8.5	10.6	12.7	14.6	17.0	19.1	23	28	32	36	40	49	57	66
1500	9.1	11.4	13.6	15.9	18.2	20	25	29	34	39	43	52	61	70
1600	9.7	12.1	14.5	17.0	19.4	22	27	32	36	41	46	56	65	75
1700	10.3	12.9	15.5	18.0	21	23	28	33	39	44	49	59	70	80
1800	10.9	13.6	16.4	19.1	22	25	30	35	41	46	52	63	74	85
1900	11.5	14.4	17.3	20	23	26	32	37	43	49	55	66	78	89
2000	12.1	15.2	18.2	21	24	27	33	39	45	52	58	70	82	94



WORKING HEIGHT conveyors are the center of a well-planned production system. Here assembly takes place at the end of the line.



IN-THE-FLOOR conveyors move uncured tires to vulcanizing pressers, then to inspection. Worker can easily cross in-floor conveyors.



CEILING-HEIGHT conveyor distributes sand to molding stations below. Plow can be operated automatically by a bin level indicator.



BULK MATERIAL, flowing continuously and uniformly from belt conveyors, may be distributed to desired locations by a wide variety of auxiliary equipment—plows, trippers, or shuttle belts. The tripper and reversible shuttle belts above move chemicals from the main belt to storage tanks.

Belt Conveyors . . .

acceleration conveyor onto the main belt at the same speed and in the same direction as the main belt is moving.

If you are loading material onto a belt from a chute, proper design will increase the life of the belt. A V notch will permit the fines to fall on the belt ahead of the coarse material and thus act as a cushion. Or you can install a screen chute (made from nonclogging wedge shaped bars) through which the fine material will fall to the belt ahead of the lumps.

Another way to prevent wear is to space the idlers under the loading area twice as close together as they have to be to support the load elsewhere.

You must match your belt with the size of pulleys you use. Undersize pulleys add greatly to the stresses inflicted on the belt. To be on the safe side your pulley should be at least 5 inches in diameter for each belt ply. Double drives require 6 inches per ply.

In mining it is common practice to protect the belt by installing pull-cord emergency switches running the entire length of the conveyor. In case of emergency there is no hunting for an emergency stop station—you just pull the cord from any spot along the conveyor. These units are just as applicable to plant conveyors.

The best way to tell when lubrication is needed is to pull an idler out of the line and examine the bearings and seals. Don't rely on an arbitrary rule such as hours of operation. Some installations have pressure lines that tie in a whole series of idlers to be lubricated from one central point.

Takeups and Drives

Every belt conveyor needs a takeup. It does three things: 1. Allows for stretch and shrinkage in the belt. 2. Insures that the minimum tension in the belt is enough to prevent undue sag between idlers. 3. Insures that the tension in the belt back of the drive pulley is enough to permit the pulley to transmit the load.

Usually 1 foot of takeup is allowed for every 100 feet of structural conveyor length. When space

permits it is better to allow 1½ feet per 100 feet. Screw takeups can be used for conveyors less than 250 feet. Gravity takeups may be of the horizontal, inclined, or vertical type. The amount of takeup can be from 3 to 40 feet or more. By proper counterweighting the belt tension can be regulated throughout the entire conveyor so that the minimum tension will always be enough to prevent undue sag, and the slack tension in back of the drive will be enough for the drive pulley to move its load.

Material usually travels from the tail or takeup pulley toward the drive pulley. Information on the selection of belt conveyor shafts is given in the FLOW DIRECTORY. It also shows the various types of conveyor drives and tells how to calculate the horsepower required.

Flat Belt Conveyors

There are two kinds of flat belt conveyors. In one, the belt slides on a smooth hardwood or sheet metal bed. In the other the belt moves on rollers.

Slider beds are especially suited for short distances and light loads (50 pounds top). Excess weight makes the belt seize the bed. Slider beds are cheaper than roller beds and do a better job of keeping loads level. Slider beds are used for small objects that are not stable on rollers, are especially suited for fragile loads such as glassware. When parts are to be deflected off a belt, a slider bed should be placed underneath to keep the belt's position constant in relation to the deflector bar.

The rollers in roller bed conveyors are regularly spaced. The spacing depends on the length and weight of the load. Only enough rolls are used to prevent the belt from sagging between them. When loads are extremely light the rollers can be spaced on 24-inch centers (occasionally on 36-inch centers). Heavier loads need roller spacing no greater than half the length of the shortest load. The main advantages of roller bed conveyors are their smooth noiseless operation and small amount of friction (a coefficient of 0.10 com-

(Continued on page 113)



Conveyor Line Designed to Handle . . .

Every Model Every Day

THE PRODUCTION LINE above hasn't gone wacky, it handles six different ranges all the time. GE's process engineers at the Appliance Park Plant in Louisville, Ky., borrowed an intermix plan from automakers. It is a plan that enables automobile firms to assemble sedans and station wagons, hardtops, and convertibles all on the same line without a hitch.

Big advantages of the new plan are in the savings of material handling time and the elimination of setup times. Before, GE used to make 2 models a day on each of its 3 lines. But each line could make only one model at a time. Now 1 line makes 6 standard ranges, another makes 6 deluxe models, and 2 other lines make custom ovens and cocktops. The switch was made without spending any money for new equipment.

How They Save

The model mix program starts 2 to 4 weeks before production begins. Expected sales for the coming month determine the production schedule for each day.

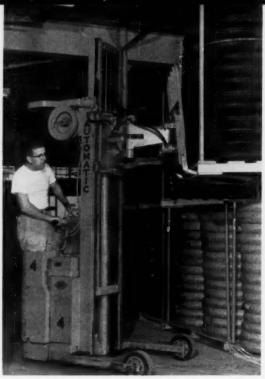
Quality. There are fewer rejects. The first man on the line marks the model number on the range so the workers will know what parts to install as it goes down the line. Because every model is made every day, workers stay familiar with all models. With the old one-model-at-a-time system, workers sometimes had to assemble a model they hadn't seen in months.

Labor. The job foreman figures what he'll need, shifts workers he can't use to other jobs. Fewer operators and repairmen are needed.

Production. Delays in incoming shipments hold no terrors. The line simply concentrates on other models. Before, running out of parts meant shutting down a whole line,

Parts Flow. A smaller stock of parts is needed. The stockroom can count on a steady flow of parts to the line with no returns. Parts left over at the end of the day had to be returned to stock under the old method.

Warehousing. Demand for space is greatly reduced. Many more ranges can be loaded in freight cars directly from the assembly line because every model is made every day. Finished inventory is much smaller because there is no need for big stocks. In two days, the production line can make all models in white plus four colors for a complete inventory.



HIGH LIFT REACH TRUCK can load 30 degrees each side of center, makes small space stacking easier.



WOODEN RACKS HOLD hard-to-store furniture. On the other hand, TV sets can be palletized, stacked.

Warehouse Engineered for

MATERIAL HANDLING will play a top role in 12 big distribution centers Montgomery Ward is going to build around the country. It's a \$50 million project.

For example, at the first installation in Detroit, they'll have to send 6,700 kinds of merchandise to 121 retail and catalog stores in a 5-state area. That kind

of handling needs good equipment and a system that makes the best use of it.

The Detroit center's handling system is based on an IBM RAMAC data processor and a fleet of industrial trucks of various types. The photographs on these pages show how each has a different kind of job to do.



TRACTOR pulls train of floor trucks from the receiving dock to carry merchandise into storage. Or-

der pickers load stock onto floor trucks, which are later picked up by tractor to be taken to shipping.

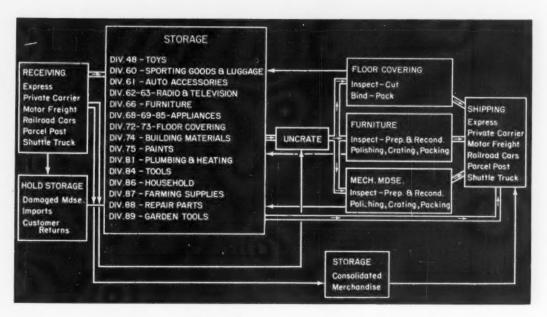


DIAGRAM shows how material is received, stored, and shipped at Montgomery Ward distribution center.

Note how furniture, floor coverings, and mechanical merchandise are processed before the final shipment.

Tight Inventory Control

RAMAC is an electronic brain that controls the center's gigantic inventory. Ordering, stocking, shipping, pricing data to the machine; from that, it can give back any kind of inventory information for all merchandise or specific items. Here's how the electronic brain and the material handling equipment's muscles work together.

Receiving

The receiving dock is enclosed and heated. It will handle 24 trucks and 10 railroad cars at once. As the merchandise is unloaded by dockers, reach trucks, and hand trucks, a checker determines how to store it: on pallets, in open storage, on dunnage, or in racks.

If possible, they stack on 4 x 4 or 5 x 5 pallets. If, because of the material's size, weight or fragility, pallets can't be used, they put it into open storage or onto racks. As much of the stacking and storing as possible is done by high-lift fork trucks.

The checker fills out a receiving memo coded to show the stock location. He sends a copy to RAMAC, which stores this information for future use. RAMAC can remember 5 million letter and number combinations, can bring back any one on request.

A train of 4-wheel hand trucks pulled by a tractor moves stock from the dock. Seven aisles each 15 feet wide, run straight through the warehouse; four 12-foot aisles intersect. The tractor driver drops off the loads in their proper storage area. Side aisles in stock areas are 7-½ feet wide.

The warehouse is sectioned off into 300 cu. ft. storage spaces in which material is stacked to 15 feet. About 25 percent is palletized storage, 50 percent open, and 25 percent rack. Metal pallet racks are being installed to stack pallets of material that can't stand compression: roofing, fertilizer, and peat moss.

Order Filling

Any order for stock is first sent to RAMAC which adjusts its inventory record and prepares an orderfill tag. These tags are sorted by section and aisle number. Stockpickers fill the order and put the merchandise on hand truck, sorted by destination. Tractors take the trucks to different parts of the shipping dock, depending on the stock's destination.

Shipping

The 48,000 square foot shipping dock is big enough for 60 trucks to be loaded at a time. RAMAC makes a shipping ticket that lists all the merchandise going to each store. This is sent to the dock and checkers tally the list against the loads.



MATERIAL HANDLING TRUCK doubles as passenger carrier by adding a platform with attached seats.



PASSENGER CARRYING POD is hauled by straddle carrier which is summoned by phone dispatcher.



MOVING RAMP carries people to and from work fast and safely.



GUIDED CAR follows on a rail, lets inspector work more freely.



MOVING WALK travels at same speed as flasks for steady pouring.

A challenge to the material handling engineer . . .

Moving Workers to the Job

In TOO MANY PLANTS there's not enough thought given to the efficient movement of people to and between jobs. It can be surprisingly costly to move production workers between operations, take maintenance men to where they are needed, keep supervisors in touch with workers. When a man is walking between jobs, he's not earning the production rate he's being paid.

The material handling engineer has the background to solve this problem. It's his job to see material is delivered where's it needed when it's needed. This same know-how can be used to devise methods of cutting workers' travel time. The engineer can use new developments in material handling equipment to move men fast and safely.

Moving sidewalks and ramps, based on conveyor design, can handle large crowds. Where you have to move men further than they usually walk but not far enough to use mobile carriers, use a moving sidewalk. The Conveyor Equipment Manufacturers Association says there are 31 types of passenger conveyors in use.

In plants, passenger conveyors save climbing of stairs and ramps, wall:ing down long corridors to save time and energy of workmen. National Steel Company's Weirten plant conveys workers from the main floor to a locker room on a floor 37 feet up. The lift takes 4 conveyors, each driven by a 7.5 hp electric motor that has a belt speed of 132 fpm. The conveyors are reversible and have moving handrails.

At Love Field, Dallas, there are 3 moving sidewalks (1,435 feet) to carry passengers from the terminal to the loading gates. Passengers stand on a rubber carpet fastened to individual 24 x 42 inch pallets linked by universal couplings. Pallets are mounted on 4.5-inch-diameter rubber tire wheels that run on a steel track. Three 30 hp electric motors transmit power through a sprocket chain with lugs that engage the underside of each pallet.

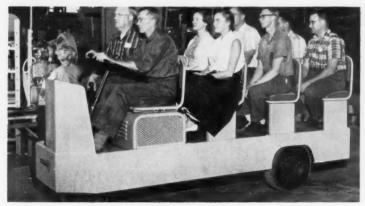
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ELECTRIC-POWER CART is used by expediters in large plant area.



ONE-MAN CART has cab for inspection use indoors and outdoors.



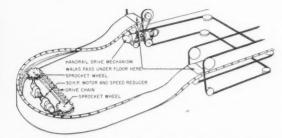
PASSENGER CARRIER handles eight people at a time. It has torque converter drive to eliminate shifting and add pulling power for trailers.



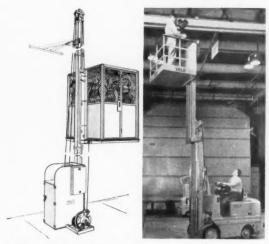
LIFT PLATFORM for one man is hydraulic, used for maintenance.



MAN-CARRYING CONVEYOR is reversible, takes miners down a 97-foot drop, travels 150 feet a minute.



MOVING SIDEWALK at Love Field takes passengers both directions. Diagram shows how belt is reversed.



TWO WAYS of lifting men to the job: demountable elevator (I.) and a platform attachment for truck (r.).



REMOVABLE SEAT was added to converted sweeper to make this personnel carrier for plant traveling.



SELF-STEERING electric trucks (10 of them) ride through aisles of the 4 shelf sections. Order picker doesn't drive; just starts and stops with his foot, leaving him free to mark billing-inventory cards as he goes.

Punch Cards, Driverless Trucks Speed

Chicago drug wholesaler boasts best dealer service in the industry, and credits its new warehouse.

ROM THE TIME his new warehouse was in the blueprint stage, Lloyd Yale knew pretty well what he wanted to do, and how to do it. It was mostly a matter of finding the right material handling equipment.

Yale is general manager of Lag Drug Co., Inc., a Chicago wholesaler serving over 1,200 retail druggists. The firm inventories about 30,000 items (\$1½ million worth). Its executives know the most important thing a warehouse offers is service. But Lag offers something extra: faster deliveries, around-the-clock order taking, emergency rare drug service. Top-notch service brought in the new business that made this warehouse necessary. And conversely, the warehouse was designed to improve service even more.

The 1-floor 85,000-square-foot warehouse is a perfect marriage of material handling and data processing. Visitors sometimes ask whether the system was designed for material handling with data processing to fit, or the other way around. "That's like the old question of the chicken and the egg," says Yale. "You can't say which came first. Nor can you draw a dividing line in our operation and say material handling ends here and data processing begins. You can't separate the two; they're completely integrated."

How It Works

Druggists phone in their orders 24 hours a day. After working hours they're tape recorded by a device nicknamed Electronic Elsie, and filled the next morning. (Lag was the first commercial user of this electronic message recorder.) On the receiving end, the

order taker sits at an IBM keypunch and cuts a punched card for each item while the druggist talks. These punched cards tell:

item
quantity
pack
account number
delivery run number
date
order taker's number

From the order taker, the punched cards go to an electronic sorter, which puts them in alphabetical order at 1,000 a minute. The goods on the shelves are in alphabetical order too, simplifying order picking. IBM machines then divide the cards into stacks of 30 orders, and they're ready to move on to the filling areas.

The warehouse is divided into five filling areas: Four sections of shelf items in the center of the floor, and one of fast-moving goods which are palletized around the edges of the floor (see flow chart).

Products in the four shelf sections are stored in alphabetical order. The alphabet is simply divived into four parts so that traffic will be about the same in each. Traffic is one-way through all the aisles, with moving stock on the right and reserve stock directly across on the left. Orders pickers work only one of the four sections. They work from 10 Barrett-Cravens Guide-O-Matic trucks, which

(Continued on page 96)



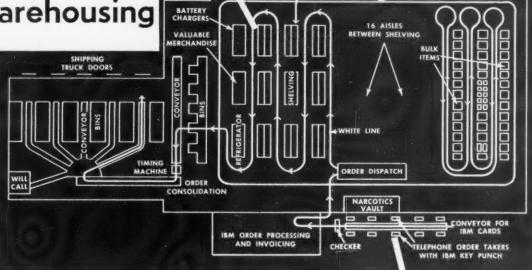


PALLETS

TRUCK DOORS

RECEIVING

Warehousing



CARTON

FLOW CHART shows detailed layout of Lag Drug Co.'s new Chicago warehouse. Top right photo shows in-floor dragline conveyor pulling stock trailers to assembly area. From assembly the orders go to packaging, then out to the druggist. This dragline is also used to distribute incoming goods to storage. Top left photo shows tractor-trailer train turning from one aisle to the next. It automatically follows the white line on the floor, or it can be driven like a conventional stand-up truck. Photo at bottom shows an order taker typing punched cards as she takes the order from the druggist. At night the orders are tape recorded; she types the cards next morning. Druggists order 3 to 10 times a week; get same-day or next-day delivery.





FOUR HYDRAULIC outriggers enable the versatile crane to make full use of its 5-ton capacity. It has

a six speed transmission, four wheel drive, and four wheel power steering. The 14-inch tires have 14 plies.

Construction Machine Doubles in Maintenance

A builder of steel mills, tunnels, bridges, and public utilities finds mobile cranes pay off in construction and maintenance jobs.

46 TYDRAULIC CRANES," says Hunkin-Conkey Construction Co., "not only handle material on construction jobs, they also help us to keep our other handling equipment going. Ours do everything—tow trailers, install equipment, handle power hammers, and pour concrete."

Here's a part of a long list of jobs that Hunkin-Conkey's two hydraulic cranes do successfully:

- Haul a string of as many as five trailers loaded with reinforcing steel.
- Help change tires, in the yard or on the job.



CRANE removes engines for maintenance or repair. A 60-gal. hydraulic pump handles loads up to 5 tons.

- Install conveyors, motors, and pumps.
- · Pour concrete in close quarters.
- Pull engines for repair.
- Handle No. 7 air-driven pile drivers.
- · Lay railroad ties and rails in difficult locations.

Added Features

Drivers take the cranes quickly into congested, narrow lanes, over rough ground to handle a pickup or unloading assignment quickly. "Another place where



SPEED is important when you are getting production equipment ready for work, and the mobile crane has it.

the hydraulic cranes shine," says Hunkin-Conkey, "is getting in under overheads where other mobile units we've tried simply couldn't go."

A good example of the crane's versatility is its lowering of a 25-foot-long pipe cutter into 10-inch diameter pipe driven into the ground and used as piles.

Hunkin-Conkey finds the crane safe in congested places, "because loads swing less. The boom responds instantly to the operators touch."

Maintenance and Depreciation

Because of the constant development of new features and improvements in mobile hydraulic cranes, Hunkin-Conkey depreciates its machines in five years. Its record show a total machine cost (excluding overhead) of \$12.11 a day, less than half the operator's wage. The cost, with the operator's wage included, is just over \$5 an hour.

"We believe," says the construction firm, "that it is better to overdo inspection and maintenance than to under-maintain. We change oil weekly, allow \$525 a year for preventive maintenance labor and the master mechanic's inspection. The diesel engine burns only 4 gallons of fuel in an 8-hour shift."

Photos courtesy Austin-Western Works, Baldwin-Lima-Hamilton Corp.



TIRE CHANGING is safe and fast and load swing is held to minimum.

Circle No. 83 on Reader Service Card for more information



Cyclone Metal Conveyor Belt

makes possible economical recovery of tile lacquer

Excess lacquer from tile-spraying process drains off quickly through the wide open mesh of this Cyclone Flat Wire Belt; can readily be captured and re-used. The abrasive qualities of the hardened lacquer have little effect on the finish of the Cyclone Belt.

More details on this time- and moneysaving story are reported in the Cyclone booklet, "How 35 Manufacturers Saved with USS Cyclone Processing Belts." Send coupon for your free copy.

Five Basic Belt Types—Cyclone Fence makes the greatest variety of belts in the industry—spiral woven chain drive, spiral woven friction drive, flat wire friction drive, flat wire sprocket drive and flex-grid. They are available in a variety of



metals, alloys and finishes. They are strong, sturdy, highly resistant to the effects of chemicals, oils, water or temperatures. Their open-mesh construction makes them readily cleaned and sanitary—permits good circulation of air or heat.

USS and Cyclone are registered trademarks

Cyclone Fence Dept.

American Steel & Wire



United States Steel

Manufactured at Waukegan, III. and Oakland, Calif. . Sales Offices, Coast to Coast

Cyclone Fence, Dept. A128, American Steel & Wire, Rockefeller Bldg., Cleveland 13, Ohio

WRITE BELOW

NAME

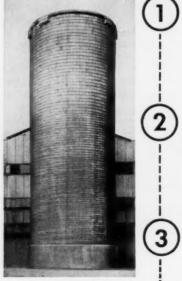
ADDRESS

CITY

STATE

Circle No. 28 on Reader Service Card for more information





Most storage bins look good on the outside,

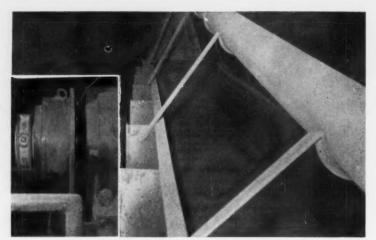
- Have they been built to meet the required method of loading?
- 2 Is the storage area and inside wall built to favor the characteristics of the material to be stored?
- Will the flow of the material meet the required volume and rate of flow at the point of discharge? We at Neff and Fry make it a point to see that all three requirements are in balance.

NEFF & FRY COMPANY 110 Elm St., Camden, Ohio



It's the <u>STAVE</u>
that makes the difference

Circle 80 on Reader Service Card



Backstopping clutch (inset) is at top of stairs, acts when power is cut off.

Clutches brake, backstop conveyors in . . .

Heavy-Load Rock Handling

THE LONE STAR CEMENT CO. in Bonner Springs, Kansas, has expanded its production of Portland cement. They have added a 10 x 340 foot rotary kiln and new equipment in the finished grinding mill. And they were able to do this because they increased their rock handling capacity by 50 percent.

To expand, they had to be able to handle more rocks that come from the first crushing process. So they installed a pan conveyor and two high-capacity bucket elevators manufactured by the Chain Belt Co. By using this equipment in the secondary crushings, they were able to double their rock intake.

Here's how it works. Rock first goes through a roll crusher, then is carried up by an inclined, 56foot pan conveyor, dropped into two hammer mills, and reduced to half-inch stone. Next, two 48-foot high-capacity bucket elevators pick it up and drop it onto a shuttle belt conveyor that goes to storage.

The pan conveyor handles up to 6-inch rock, has a lift of 24 degrees. Gravity spouts handle the intake and discharge. A 50 hp, 1800 rpm, 440 volt, squirrel-cage induction motor connected to a Falk reducer with a 70.2-to-1 ratio

powers it. A 40 hp, 1300 rpm, 440 volt, squirrel-cage induction motor connected to a Falk reducer with a 54.0-to-1 ratio powers each bucket elevator. The shuttle belt is driven by a 15 hp gearmotor with a 56 rpm output, capable of moving 350 feet a minute in either direction. The carriage is driven by a 10 hp gearmotor with a 56 rpm output, which can move at 125 fpm.

The bucket elevators handle about 2,800 tons of rock a day. With these heavy loads the machines had to have braking or backstopping controls. Large-bore Formsprag clutches were put on the bucket elevators and pan conveyor. They prevent the loaded side from moving backwards and act as brakes to prevent reverse motion when the motor is off. The clutches permit forward overrunning at speeds up to 185 rpm, have a torque capacity of 18,500 poundfeet. They are sealed so that rock dust cannot enter.

Backstopping action takes place when the motor halts, stopping the forward drive of the shaft. Immediately the force on the inner race sprags is transmitted to the outer race sprags in such a position as to prevent reverse motion of the shaft.

PACKAGING AND SHIPPING SECTION

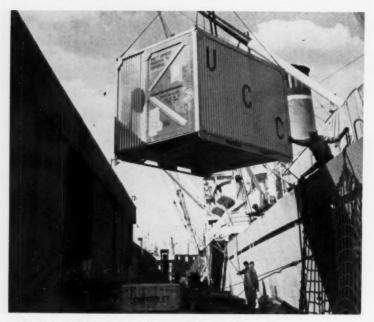
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PACKAGING & SHIPPING IDEA of the month

Overseas Shipping in Domestic Packs

Hi-fi's go undamaged from New York to Africa in corrugated containers.



VAN CONTAINER is hoisted aboard ship for trip overseas. Its contents go from factory to foreign consignee with no loading or unloading in between. Lower left shows loading; right shows handling by fork truck.





T HE S. S. CONSTANTSIA sailed from New York harbor recently on a voyage viewed by packaging and shipping men on both sides of the world. Her destination: South Africa. Her cargo: the first regular marine application of the ACF Adapto, a land-sea-air container system designed by ACF Industries, Inc.

The shipment was made by United Cargo Corp. It consisted of delicate hi-fi and phonographic equipment. Notable as far as the goods is concerned was the fact that they were packaged in their regular factory cartons—standard corrugated. No special overseas containers.

United Cargo has 101 of the ACF containers, each with a 500 cubic foot capacity. They're made of aluminum, are air-tight and water-tight, come regular or in refrigerated models. So well do they protect their contents that no other protective packaging is needed.

But that's not their only advantage. United Cargo loads them at the factory, then ships them by truck, train, and ship, without unpacking. They're fastened to vehicle beds with special latches that release from the pressure of lift truck forks.

That first shipment was entirely successful as far as United Cargo is concerned, cutting shipping costs some 25 percent. It will undoubtedly be followed by more.

Simoniz puts "protection" in a can

Packomatic[®]
puts the cans
in a case



Simoniz

CHILDPROOF

FLOOR

Packomatic equipment feeds, forms, positions, loads, seals and imprints corrugated shipping containers automatically. However you ship—in multi-ply paper bags, or in corrugated shipping containers; whatever you "package"—a can, a carton, a box or a bale—there's a Packomatic machine designed to handle your shipping container requirements. Packomatic machines, geared to your production line, will feed, form, position, load, seal and imprint corrugated containers automatically—or do any of these operations singly as a complement to your existing packaging facilities. Let one of our sales engineers suggest the start of a long-range packaging program for your plant. Investigate the Packomatic method of cutting costs and boosting production. Call, write or wire today.

Circle No. 42 on Reader Service Card for more information

Fully-automatic Packomatic Case Former-Loader, part of a fully-automated production line at the Simoniz plant, Kankakee, Illinois. Other Packomatics on the Simoniz line include Case Sealers and Case Imprinters.



Begin to automate your packaging line with this highspeed, fully-automatic Case Sealer. Aligns loaded cases, positions fleps, glues, seals and discharges — and no operator needed! Available in wide range of sizes. Semiautomatic, too. Call or write for additional information.

J. L. FERGUSON CO. Joliet 7, Illinois

PACKOMATICS include the Bale Sealer • Case Sealers • Opener-Loaders • Case Imprinters • Telescoping Volumetric Fillers • Packer-Gluers • Semi-automatic or fully-automatic.

Selecting Corrugated Containers

How much do you know about the most widely used of all container materials? The wrong choice will waste your money, either through wasted materials or damaged goods.

by I. E. Wright

Director of Research and Development

Stone Container Corporation

ANY people think the heaviest corrugated container is the best because it gives the most protection. But it's not that simple. Unless, of course, cost doesn't matter. The truth is that any container that protects too much or too little is wasting your money.

In addition to protection rendered, you must also consider how you're going to fill and close the package, what construction is best for your product, the best size, how it's going to be handled, and display and advertising possibilities.

What Test Corrugated?

Strength of corrugated board is measured by "test." That's the industry's standard unit of measure, based on bursting and puncture tests, caliper, weight, etc. Check the freight regulations for the vehicle you're using. They usually specify the test required for your product.

Latest technical developments keep producing stronger corrugated boards. That means you can use corrugated containers now for many applications where it wasn't safe before.

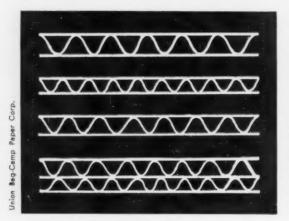
Which Flute Is Best?

The flutes are the backbone of the corrugated board. They absorb and distribute shock, provide extra cushioning and insulation.

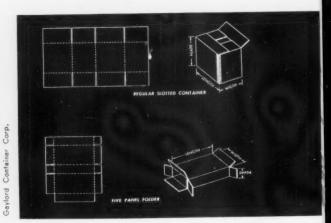
There are three basic flutes: A, B, and C (see chart below). The A flute has the highest arch. It's used mostly for fragile articles because its height gives excellent cushioning and stacking strength. The B flute is slightly lower than A, takes up less car and warehouse space. It's good for heavy items like canned goods, which support their own weight. The C flute is about half way between A and B, combines the best features of both. It's probably the most commonly used today. There are also many double-wall combinations of flutes for special uses.

Construction:

Regular slotted, full flap slotted, one-piece folder,



MOST COMMON FLUTES. Top to bottom: A, B, C, and double-wall. A has 3/16" arch, 36 flutes per ft. B has 1/8" arch, 50 flutes per ft. C has 5/32" arch, 42 flutes per ft. Double-wall can be any combination.



BOX STYLES. There are hundreds of possible designs of corrugated boxes. At least 15 of them are commonly used; the rest are for special application. By far the most common of all is the regular slotted

Miles ...

Maximum weight of lase and canteens	Maximum inside dimensions, length, width and depth added	Minimum combined weight of facings of corrugated fibrobeard, including conter from in double-wall boxes.	Minimum test par aguare inch of combines board, either solis or corrugated
(Pounds)	(Inches)	(Pounds per 1000 sq. ft.)	(Pounds)
20	40	52	125
40	90	75	175
65	90	84	200
90	90	138	275
120	100	180	350
140	110	****	500
140	120		600
	Double-wall	corrugated boxes	
65	90	92	200
90	90	110	275
120	100	126	350
140	110	222	- 500
160	120	270	600
225	60	110	275
300	60	126	350
De	uble-faced corrug	ated and solid fibre box	18
225	60	138	275
300	60	180	350

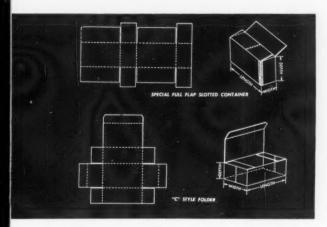
telescoping . . . there are enough different styles of corrugated boxes to confuse even the experts (see chart below). Which one should you use?

That question is best answered by your supplier. Give him a sample of your product. Tell him where it's going, how it's going, and how it will be handled. The right design can cure a lot of headaches for you. A good example is the box with built-in pallet for easy handling. Talk it over with your supplier.

What About Size?

You may not have much to say about the size of your container. Size of product and freight regulations may decide for you. It's easy to figure when large products are packed one to a container. Just let the product be your guide. Smaller products packed several to a box may be governed by freight regulations. These are too complex to discuss here. Check with your carrier.

From the standpoint of material cost alone, the (Continued on page 88)



container. Five panel folder is ideal for long narrow products, has 3 thicknesses of board at ends. Full flap slotted gives extra strength at top and bottom. "C" style folder is example of more complex design.

The Story of a Box From Planning to Production

HERE'S the case history of a box designed to do more than just deliver the product safely. It reduces labor costs too, and gives the company a big merchandising boost.

The story took place at Bersted Mfg. Div. of the McGraw Edison Co., Kirksville, Mo., where thousands of Toastmaster heaters are manufactured every day. It began when Bersted called its supplier in to talk about corrugated boxes for the heaters.

At the first meeting customer and supplier (Hinde & Dauch Div. of West Virginia Pulp & Paper Co.) talked about Bersted's overall packaging objectives. They discussed the heaters—







SOME OF THE STEPS a box goes through when on the planning boards. Top left: packaging engineer designs interior pack around the product. Top right: lab technician checks its performance on test machines. Below: the finished product.

size, shape, weight, dollar value, fragility, number of units to a box, and the number sold yearly. They also had to consider whether packaging would be by hand or automatic, how the boxes would be sealed, the method of shipping, and what handling methods would be used. On the merchandising side, they evaluated sales outlets, distributors' storage and display problems, whether the corrugated box would reach the consumer, and how it would do the best selling job.

After that preliminary talk, customer and supplier understood each other pretty well. The customer knew what he could expect; the supplier

(Continued on page 88)

Turntables Keep Delivery Trucks On The Move

7-Up believes in mechanized handling, and keeps looking for better ways to do things.

THOROUGHLY SOLD on warehouse mechaniza-L tion is Frans Arvidson, general superintendent of 7-Up Bottling Co.'s Los Angeles plant. And with good

"Despite increased production and labor costing twice what it used to," says Arvidson, "we spend less on labor today than we did 12 years ago. That's when we stopped loading and unloading delivery trucks by hand and started using fork trucks."

That was a big step 12 years ago. But this company keeps looking for ways to improve. Now they've done it again. Today the shipping room doesn't look anything like it did a year ago.

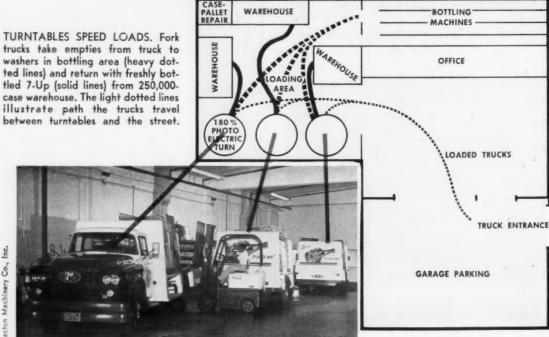
A Flash of Light Does It:

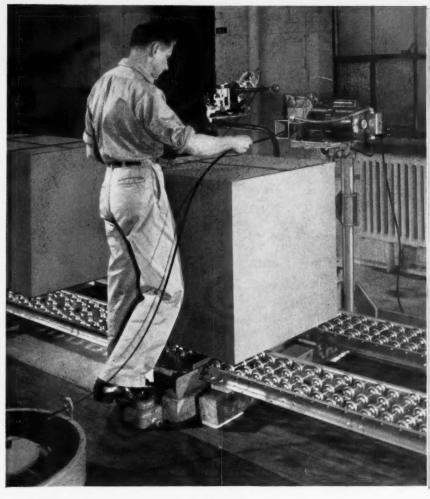
Latest addition: three 18-foot electric turntables to rotate delivery trucks, to speed loading and unloading. and get the trucks out on the road where they belong.

The turntables are flush-mounted in the shipping room floor. An incoming truck drives onto one of them, and the fun begins. A fork truck immediately starts unloading cases of empties (all palletized) from the side of the truck facing out, and replaces them with freshly bottled 7-Up. The first side done, the fork truck operator flashes his spotlight on an electric eye, and the turntable swings around exposing the unworked side of the delivery truck.

The Old Way:

Fork truck operators had to scurry and jocky their trucks around to the other side of the delivery trucks. They wasted a lot of time that way. Now they can load 60 trucks in an 8-hour shift, more than 35,000 cases a day (2 shifts).





- Feeder Unit powered by 1/4 hp 115 volt AC motor
- Adjustable Frame Support and Strap Chute Sections

- Foot Switch
- Signode Model DF20
 Strap Dispenser

New Signode power strap feeder puts strapping around big packages fast

Another "stand and wait" job hits the skids! Now, for the first time, one man straps big packages without a helper and without walking around the package. The new Signode power strap feeder applies 200 or more straps per hour to big packages. Only eight to ten seconds are needed to apply one strap to the container above.

Cost of the equipment is modest, yet it handles a wide range of package shapes and sizes. Components are shipped ready for assembly, tailored to your needs. The new Model PSF-1 can be used with any Signode seal feed tool—hand, pneumatic, or electric—mounted in a tool balancer. Strapping may be fed either up or down. The feeder will take any one size of any kind of Signode strapping ¾" or smaller. Strap size adjustment is simple.

The PSF-1 Power Strap Feeder is simple and versatile. It can be inserted into almost any conveyor system or set up in a separate strapping station for unitizing.

For information about this important advancement in strapping speed and ease, call the Signode man near you, or write:



SIGNODE STEEL STRAPPING CO.

2618 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto Circle No. 100 on Reader Service Card for more information



Packaging—Group VII
Best of Show

SHOWN HERE are the first prize winners at the 1958 National Championship Protective Packaging and Material Handling Competition. The Competition was held in conjunction with the 13th National Industrial Packaging, Handling, and Shipping Show, held in Chicago October 13 through 15 by the Society of Packaging and Handling Engineers.

SPHE Show Competition Winners

16 winners in 7 categories at Packaging and Handling Exposition in Chicago. Military package wins Best of Show.

PACKAGING ENTRIES:

Group I—Corrugated or solid fibre boxes.

1st prize: William H. Robinson, General Electric Co., Meter Department, Somersworth, N. H. The package is a multi-purpose container for all sizes of single phase meters, made of molded kraft pulp with RSC kraft carton. Dimensions: 16-3/8" x 15-5/8" x 8". Shipping weight: 221/2 pounds. Three-piece pack replaces five-piece all-corrugated pack. Cuts material cost 8 percent, labor 10 percent, transportation 3 percent. Kraft board obtained from scrapped containers in the plant.

2nd prize: Peter Henningsen, Minneapolis-Honeywell Regulator

(Continued on page 115)



Packaging-Group I



Packaging-Group IV



Packaging-Group II



Packaging-Group V



Packaging-Group III



Material Handling

PACKAGED BY GAYLORD YOUR PRODUCT GOES FIRST CLASS

Corrugated boxes by Gaylord deliver positive protection against the hazards of transportation. No matter how your product goes to market-Gaylord corrugated gives assurance that it travels first class . . . and looks the part.

In any language, Gaylord boxes speak for themselves.





HEADQUARTERS, ST. LOUIS PLANTS COAST TO COAST

DIVISION OF Crown Zellerbach Corporation



Work Safely

on

1 to 12 Step Ladder-Stands



Roll Easily!

Special casters retract automatically under users weight — 9 steps and over feature foot activated front caster brake.



SQUARE tubular steel frame. Allwelded steel construction. Safe expanded metal treads.







Special taper lets you stand closer to your work. Entire unit finished with rust-resistant aluminum coating. FREE CATALOG!

ALUMINUM LADDER CO.

Dept.E-8 Worthington, Pa.

Circle 6 on Reader Service Card

SELECTING CORRUGATED CONTAINERS . . .

(Continued from page 83)

cheapest container to produce is one with equal length and depth, and width equal to one-half its length. See page B/34 of 1958-59 FLOW DIRECTORY for a nomogram to select the most efficient package shape for your product.

Corner Joint:

The three most common manufacturer's joints are taped, stitched, and glued, in that order. Taped joints are smoother inside than the others, tend to stack more smoothly, and seal out dust and dirt. On the other hand, they're the most expensive, and may be weakened by moisture. Stitched joints, using steel staples driven from the outside, are probably the strongest and least expensive. But they're not recommended for easyto-scratch articles, because of the protruding metal stitches. Glued joints are the only ones that leave the outside of the box completely unmarked. That makes them the best for printing. But like taped joints, they may weaken when damp.

Display Value:

Somebody once figured that 17 potential customers see the average product from the time it leaves your plant till it's delivered. So it pays to put a sales message on your containers. Some supermarket products, for example, rely more on the printing on containers than on any other type of advertising.

Most container manufacturers can print any mesage or design you want, in any colors. The day of the plain brown corrugated box is vanishing fast.

Handling and Shipping Methods:

We talked about this briefly in the earlier section on construction. Handling-conscious design is perhaps one of the biggest reasons for the quick growth of the corrugated box industry. Manufacturers know how much it's possible to save in material handling. The palletized box is just one example of what can be done. Take a look at polyethylene-lined corrugated boxes for liquids. Or the drum-type corrugated box that locks shut when the lid is applied. Or the box with hand holes or handles for easy carrying.

The box you don't know about may be just the one you need. Or, if it hasn't been designed yet, your supplier may be able to make a special one for you.

THE STORY OF A BOX . . .

(Continued from page 83)

understood what his client needed.

Now the project moved into the supplier's laboratory, where trained technicians began to put ideas into corrugated. With samples of the heaters as models, they

tailored corrugated board into custom-fitted boxes and interior pack-

aging.

The initial hand-made boxes were put through tests to see how they would hold up under the worst conditions likely to be encountered. They were shaken, bounced, dropped, and crushed. These tests showed where changes had to be made to further reduce possibility of damage. Finally they came up with a box that would ship the product safely, cheaply.

Having constructed a box that would do the physical part of the job, the supplier sent it to his art department for the more subtle merchandising problem. The customer wanted a box that would serve as a miniature traveling salesman. It was up to the box manufacturer to come up with the right design, color, and typography to identify the product and make people want to buy it.

Finally the box was approved, and it went into production. But even after the dies had been made, the first boxes produced had to pass laboratory tests to make sure that the actual production box was as good as the hand-made prototype.

The Toastmaster people are now using these boxes to ship all three models of their electric heaters. They're happy with the protection (damage claims are almost negligible), advertising value, and easy handling of their new containers.



GETS FAST,
SHORT-HAUL
DELIVERIES OF
INTERNATIONAL
MULTIWALL
BAGS!

You benefit directly from International Paper's modern, new Bagpak plant in Litchfield, Illinois.

If your plant is situated in the heart of this busy mid-western market, you now have an even closer source for the full line of International multiwall bags.

Industry in other parts of the United States benefits by faster and better service too. For Litchfield's capacity eases the demand on our other plants and warehouse facilities.

With this increase in manufacturing facilities and distribution efficiency, it will pay you to remember that wherever you are, you're never far from International Paper . . .

your most dependable source of supply . . .

INTERNATIONAL PAPER

BAGPAK DIVISION, N.Y.17, N.Y.



Circle No. 56 on Reader Service Card for more information



CYLINDA-PAK

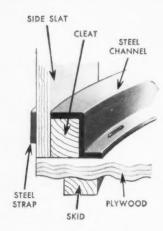
Generalift® Wirebound Cylindrical Pallet Boxes Cut Handling and Shipping Costs with Safety

New Cylinda-Pak Generalift wirebound pallet boxes bring a new concept in containers for bulk handling. Strong and resilient design prevents puncture or breakage that causes spillage and allows extra high stacking without bulging. They are light in weight but have an exceptional ratio of tare weight to contents. Cylinda-Paks can be made tight for fine materials or ventilated for perishable products. They ship and store flat and can be assembled by unskilled labor in 4 man minutes.

The carload of Cylinda-Pak Generalifts in the photo above proved they could take rough treatment and still deliver their product safely with no spillage. These Cylinda-Paks contained approximately 1400 lbs. each of granular material and were shipped more than 1800 miles to the East Coast. En route this car and others received such rough treatment that 2" x 8" bulkheads were shattered—some of the bulkheading is shown protruding among the containers in the center of the car—and none of the granular material was lost.

Cylinda-Paks have sides of tough hardwood, bound by galvanized steel wires. The base of rigid plywood is mounted on hardwood skids and equipped with a special steel channel, shown at the right. Cleats on the inside at the bottom of the wirebound vertical side section are held in the channel by a tensioned steel strap.

Cylinda-Pak Generalifts are available both in "one-trip" and "reusable" construction and in a variety of sizes for both truck and rail shipments. Write for full details.



(Patent Applied-For)



ENGINEERED CONTAINERS FOR EVERY SHIPPING NEED

Wirebound Crates and Boxes • Generalift Pallet Boxes • Stitched Panel Crates
All-Bound Boxes • Corrugated Containers

FACTORIES: Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Nashville; Sheboygan; Winchendon, Mass.; Meridian, Miss.; Continental Box Co., Inc., Houston.

GENERAL BOX COMPANY . 1847 MINER STREET . DES PLAINES, ILLINOIS



4000 cartons shipped without one fastening failure since changing to stapling

Heavy steel stampings leave this shipping room for destinations all over the U. S. and Canada. Shipping weight is up to 225 pounds per carton. Cartons are securely fastened with Bostitch wide-crown staples—10 each in top and bottom.

4000 cartons have been shipped since changing to stapled containers from nailed wooden crates. Not one fastening failure was reported.

Sealing these cartons with the Bostitch D14 widecrown stapler is three times faster than nailing wooden crates. Packing costs are approximately one-third as much. Shipping charges are down because of reduced tare.

A Bostitch Economy Man helped this company find these competitive advantages in their shipping room. An Economy Man will gladly work with you to locate savings in time and money now hidden in yours. There is no obligation whatsoever. He's listed under "Bostitch" in your telephone directory. Call him or mark and mail the coupon for information.

Fasten it better and faster with



Please send me literature on the in the shipping room.	use of Bostitch equipment			
We ship				
	(Kind of product)			
We now ship in	d of container)			
Our containers are fastened with	o or containery			
our comments are residence with	(Fastening method)			
Name				
Firm				
Address				
City Zone	State			









FROM ANY ANGLE

AMERICAN

PALLET AND SKID TRUCKS

Have... More Operator Benefits ... More Owner Economy

They Raise, Roll and Steer Easier.

No Flying Handles.

Yet they sell for as little as

\$31500

Ask your AMERICAN Distributor to demonstrate Pallet and Skid Models for easy handling of 2,000, 3,000,4,000,6,000-lb. loads.

Products of

The American Pulley Company

MATERIALS-HANDLING DIVISION

Philadelphia 29, Pennsylvania Circle No. 135 on Reader Service Card for more information

. . . USEFUL LITERATURE

(Continued from page 59)

Gives Tape and Adhesive Data:

A catalog has been published by Permacel-Lepage's Inc. that lists its entire line of tapes and adhesives. In the 12-page catalog, easy-to-read tables give a brief description of each product, its outstanding properties and applications. Government specifications, tensile strength, and price list references are listed.

Permacel-Lepage's Inc.
Circle 347 on Reader Service Card

Shows Aluminum Conveyors:

A catalog sheet issued by The E. W. Buschman Co. provides full details on the lightweight line of aluminum wheel and roller conveyors. These conveyor sections feature the exclusive "Quick-Eez" coupling. The catalog sheet provides specifications on every model in the series.

E. W. Buschman Co. Circle 348 on Reader Service Card

Describes Busway with Aluminum Conductors:

A 225-1000 ampere plug-in Flex-A-Power busway with aluminum conductors is the subject of a 24-page booklet, GEA-6173. This bulletin is published by the Distribution Assemblies Department of General Electric. It lists features, applications, ratings, construction information, description, dimensions, weights, installation instructions, and guide-form specifications.

Distribution Assemblies Dept., General Electric Co.

Circle 349 on Reader Service Card

Describes Automation Protection:

Palmer-Bee Co. has published a bulletin on its instantaneous jam protection panel. This panel affords protection for conveyors, automation equipment, and other industrial powered machinery. When jam occurs on multiple drives, a red light indicates the overloaded motor.

Palmer-Bee Co.

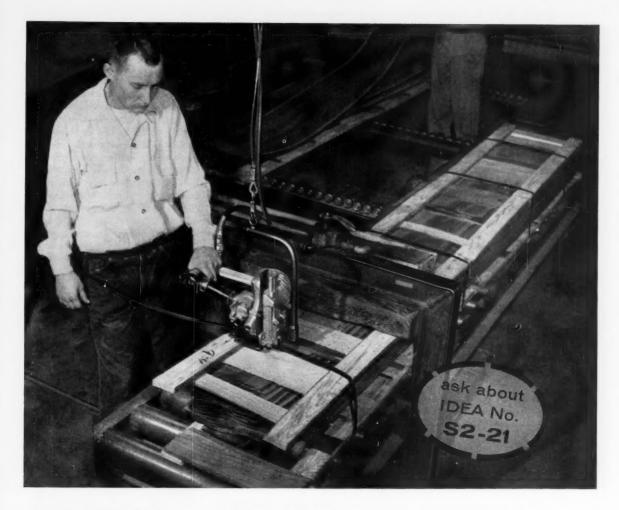
Circle 350 on Reader Service Card

Heavy-Duty Concrete Floor Surfacing:

A heavy-duty concrete floor surfacing for industrial, commercial and institutional use is described in this illustrated booklet.

Kalman Floor Company

Circle 351 on Reader Service Card



Check your AIM*... Hartzell Industries does...

First Fully-Powered Steelstrapper bundles veneer

Acme Idea Man T. E. Starr serves many progressive companies with fast, economical packaging ideas.



HARTZELL INDUSTRIES, PIQUA, OHIO, was interested when their Acme Idea Man showed them the new A4, the first fully-powered Steelstrapper. Especially when they saw how quickly and easily it tensioned, sealed and cut steel strapping—all with air power and fingertip controls. (Idea No. S2-21)

They installed the A4, and now two men handle the flitch drying, stacking and bundling operation more easily, with less fatigue. Packaging costs are reduced and flitch bundling now keeps pace with production.

Since the A4 tightens each strap to the same pre-determined tension, flitches stay tight and secure, arriving at destination in excellent condition.

*Check your Acme Idea Man for the latest Idea methods and equipment. Write Dept. FDS-128, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.



STEEL STRAPPING

Circle No. 4 on Reader Service Card for more information



Available with or without

FISCHBEIN FASEA

Tape Binding Attachment

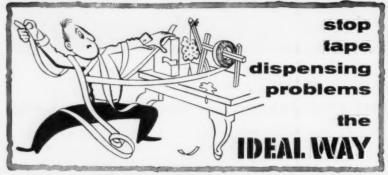
Produces perfect tape-bound closures. Complete portability maintained. Attachment can be quickly removed when tape binding is not required.

For details and complete catalog file of Fischbein Bag Closing Equipment . . . write. . .

DAVE FISCHBEIN CO.

2720 30th Ave., Dept. 48, Mpls. 6, Minn.

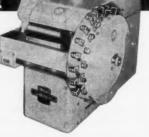




with an IDEAL 200E

Are old-fashioned "guess and mess" taping methods gumming up the works in your plant? Then get the gummed tape length you want (accurately measured and cut from 3" to 105") when you want it (instant-acting selectamatic keyboard) without waste . . . complete moistening with thermostatically controlled heated water . . . just the right amount of water to give proper moistening for proper sealing. Will cleanly cut all gummed tapes, even reinforced or cloth tapes up to 4" wide.





FREE Illustrated Brochure

STENCIL MACHINE CO.

104 IOWA AVE., BELLEVILLE, ILL.

Circle No. 55 on Reader Service Card for more information

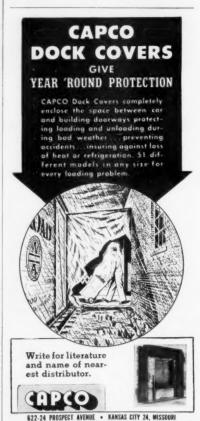
MOVING WORKERS TO THE JOB . . .

(Continued from page 72)

Moving Men in Vehicles

You can find personnel carriers of many sizes and designs, powered by gasoline, LP-Gas, diesel, and electricity. Managers use them to inspect widely separated operations; plant police and firemen need them to handle emergency calls. Other uses: distributing main, taking visitors through a plant, moving maintenance men to the job, carrying production workers between operations. Vehicles range from one-seaters to bigger units that can handle 8 or more passengers.

Timken Roller Bearing Co. has 3 metal pods that are outfitted to carry passengers. They are picked up and moved by straddle carriers, thus becoming part-time buses. One hauls people around the plant; the second is a mobile headquarters for labor crews. The third is a trouble-shooters' shop that carries maintenance men and equipment. All are radio controlled. These



Circle No. 23 on Reader Service Card MATERIAL HANDLING ENGINEERING pods are separate units. Any straddle carrier that's available can do the hauling. In this way Timken gets fuller use out of its 15 straddle carriers, which are otherwise used for material handling.

Some personnel carriers do double duty. The seats are mounted on a rear platform and can be removed for material handling. Torque converter drive is being introduced into larger passenger carriers to eliminate gear shifting. The added power is useful for pulling trailers during plant tours or peak traffic periods.

Cleveland Cap Screw Co. uses two 4-seater, electric-power carriers in its 9-acre plant. Executives use them to make trips from plant to office. The payroll department rides them to distribute paychecks and check timecards. Expediters ride them to speed up contacts in the plant. The cars have 24-volt systems—4 batteries connected in parallel. They run 10 hours on a charging, can be charged from any 110-volt line.

Lifting Workers to the Job

Maintenance work often has to be done in high, out-of-the-way places. You can make these jobs easier by using portable elevators with special platforms to hold the men. Or you can get platform attachments for fork lift trucks.

There are hydraulic lift platforms centered over a single cylinder or mounted on multiple cylinders. Most of these are stationary or have limited movement. They can support men working at different levels, on, say, giant presses or rockets. The large hydraulic platforms will lift heavy loads of men and equipment.

A demountable personnel elevator can carry men and can be moved from job to job. Its car travels on a single vertical rail. It is useful for lifting men on construction and repair jobs.

For the information and photographs used in this article, MHE thanks: Clark Equipment Co.; Conveyor Equipment Manufacturers Association; Cushman Mfg. Co.; Economy Engineering Co.; Gaud-Reau Associates; B. F. Goodrich Co.; Hawkeye Products Corp.; Kalamazoo Manufacturing Co.; Otis Elevator Co.; The Prime-Mover Co.; Stephens-Adamson Mfg. Co.; G. H. Tennant Co.; Timken Roller Bearing Co.; Victor Adding Machine Co., Electri-Car Div.; The Yale & Towne Mfg. Co.



handle complete warehousing operation

UNLOADS TRUCKS, STORES MATERIAL IN 1 OPERATION

When the Per-Fit Products Corp., Indianapolis manufacturer of aluminum windows installed a Chicago Tramrail TRAK-RAK unit in its warehouse, it gained 4 big advantages:

- 1. Increased the capacity of existing storage area.
- Reduced handling costs by permitting 1 man to handle the entire warehouse.
- Kept production lines supplied with on-time material deliveries.
 Handled high grade aluminum extrusions without damage.
- The TRAK-RAK unit installed at Per-Fit consists of a 1 Ton capacity underrunning crane from which is suspended an electrically operated rotating telescoping column which is fitted with a three-fork carriage. All operations of the TRAK-RAK unit are controlled by the operator, who rides with the carriage. The unit serves a series of self-standing racks equipped with arms which receive the bundled material. Because the TRAK-RAK column re-

quires minimum operating space, the aisles between racks are very narrow. Trucks delivering material are unloaded (top picture) by the unit, which moves over the tops of the racks (below) to the proper rack and deposits its load in 1 operation. When a particular bundle is required by production, the

operator moves to the rack, picks up the bundle, and, moving overhead, travels to the conveyor lines (drawing) and sets the bundle down on the designated conveyor line.



TRAK-RAK Systems of vertical storage and handling are saving time and money in warehouses and production plants of all types. For complete details on how TRAK-RAK can help solve your problems, write:

CHICAGO TRAMRAIL CORPORATION
1322 S. Kostner Avenue • Chicago 23, Illinois

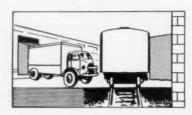
Circle No. 134 on Reader Service Card for more information



is your LOADING DOCK inside... or outside?

There's a big difference . . . in fuel costs . . . in employee morale . . . in productivity of workers . . . in absenteeism due to colds or accidents . . . in protection of merchandise.

Only DAZZO Dock Shelters provide quick and full protection for dock operations in bad weather. Less than full protection is merely money wasted!



DAZZO Dock Shelters adjust themselves automatically to different dimensions of railroad cars or trucks. They expand in seconds by gravity, without use of springs. They retract out of the way when not in use.

Save *money* and *grief* . . . write for the facts about DAZZO Dock Shelters today!

DAZZO PRODUCTS, INC.

152 Bleecker Street, New York 12, N. Y.

ORegon 3-5298

Circle 124 on Reader Service Card 96

PUNCH CARDS, DRIVERLESS TRUCKS SPEED WAREHOUSING

(Continued from page 74)

pull specially designed stock trailers. These trucks drive themselves; the order picker is just along for the ride. They're electric-powered and have an electronic brain that follows a white line on the floor.

Guide-O-Matics are completely automatic, following the white line on the floor or a thin wire under the floor. They start and stop themselves at designated stations, can blow their horns to let you know they're there, and even stop themselves if anything gets in their path. But Lag Drug finds it more convenient to use them semi-automatically. Everything is fully automatic except starting and stopping, which the order picker controls with a pedal. The Guide-O-Matics can also be driven manually when needed, like conventional walkies.

There's an IBM billing-inventory card right next to each item on the shelves. As the pickers move Circle 20 on Reader Service Card





BIGELOW-GARVEY
COLLAPSIBLE
TIGHT-CORNER
PALLET BOXES

THEY'RE REUSABLE

- Economical
 - Safe and Neat
 More Convenient
 - Quickly Assembled
 - Handles up to 5000 lbs.
 - Collapsible When Not in Use
 - Specially Made For Your Needs

Over 33 Years Material Handling Experience



Always the best...now even better

NEW forward-design ROLACODER



AUTOMATIC CASE-MARKING AND CODE-DATING ATTACHMENT

Holds enough ink for a week!

- Extra compact—adaptable to any conveyor, case-sealer, etc.
- Simplified construction—for trouble-free performance
- Precision-built—assures sharp uniform imprints up to 3" deep, accurately located on case after case
- Swing-out mounting for easier maintenance
- Patented "Metalok®" type base holds type more securely, makes copy changing easier

Write today for full details about the new "Series 300 Rolacoder" case-marking attachment





GOTTSCHO, Dept. D HILLSIDE 5, N. J.

In Canada: Richardson Agencies, Ltd. Toronto and Montreal

Circle No. 50 on Reader Service Card for more information

MATERIAL HANDLING ENGINEERING

down the aisles, starting and stopping their Guide-O-Matics for each item on their order cards, they take one of the inventory cards for each item, and mark in pencil the quantity picked. These cards tell:

quantity picked (pencilled)
description
pack
symbols (narcotic, etc)
fair trade price
list price
discount
retail tax if any
manufacturer's item number

After picking, the two sets of cards go back to data processing for billing and inventory adjustment, also electronic. The pickers uncouple the filled trailers and hitch them onto a Trukveyor (an in-the-floor dragline) running the entire perimeter of the warehouse.

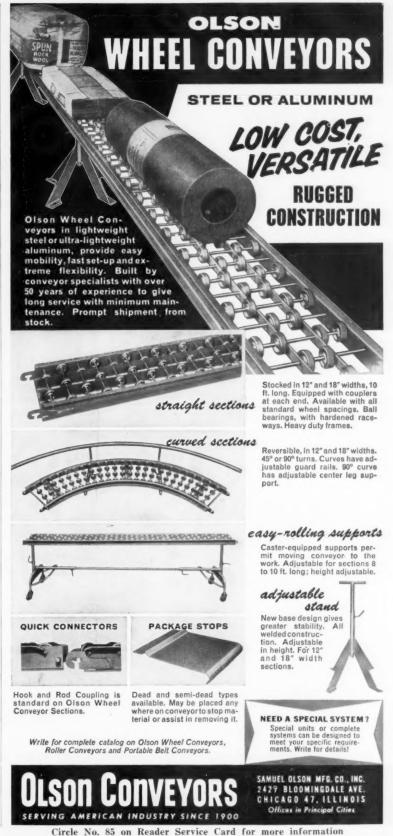
A loaded trailer may hold parts of several different orders. The Trukveyor takes trailers from the five storage areas to an assembly station, where the goods converge into completed orders.

From the assembly area the goods go by belt conveyor to packing, then out to the druggist the same day his order was received, or the next day if specified.

Receiving:

All merchandise comes in by truck. Most goods come palletized, except bulky things like toilet tissue, which workers palletize as they unload. A 2,000-pound Aisle-Saver stand-up electric fork truck does the unloading. It has a telescoping mast low enough to enter highway trailers when it's collapsed, but high enough for ceiling-high stacking when extended. A Levelator power makes it easy for the fork truck to drive right into the trailers. After it's unloaded from the truck, the incoming merchandise is put on the Trukveyor and draglined to its storage spot.

EQUIPMENT: Dragline conveyor, Link-Belt Co.; electric trucks, Barrett-Cravens Co.; batteries, C & D Batteries, Inc.; battery chargers, Berg-Gibson Mfg. Co.; trailers, Jarke Mfg. Co. and Lansing Co.; belt conveyors, New London Engineering Co.; shelving, Lyon Metal Products, Inc.; dock levelers, Rotary Lift Co.; floor equipment, S. C. Lawlor Co.



SAVE 50%

ON YOUR ADDRESSING COSTS WITH

AUTOMATIC

STENCILER

Whether you must stencil 5 cartons or 5,000 the ROL-FLO will give you uninterrupted performance.

Proper pressure on the squeezable plastic handle keeps the roller saturated and working perfectly at all times. Designed especially for those whose stenciling needs call for a greater supply of ink or where an ink pad can not be conveniently carried.

This means high speed stenciling at a saving of 50% for your production line addressing.





SEND FOR YOUR FREE COPY OF "HANDY HELPER" SHIPPING ROOM SUPPLY CATALOG

P. O. BOX 269 HERRIN, ILL.



COMPLETE DOCK PROTECTION IN SECONDS — ONE MAN OPERATION



Just think . . . in seconds you can give trucks at your dock complete protection on the coldest days . . . save personnel from winter colds and accidents . . . protect products from weather damage and freezing. Rugged, heavy duty, spring-loaded steel frame needs no maintenance . . . UL approved fabrics are fire, water, mildew-resistant.

WRITE for complete details and prices.

MED> FROMMEL

> FROMMELT INDUSTRIES

The Name To Remember For Approved Safety Products

PALITON

HYDRAULIC HAND PALLET TRUCK



NO OTHER TRUCK GIVES YOU MORE FOR LESS

4600 lb Capacity
6000 lb Load Test
Full 5 inch Lift
31/4 inch Minimum Height
Rugged, Heavy Duty Construction
Light Weight for Easy Movement
Auto Safety Relief Valve
Grease Gun Lubrication
Roller & Ball Bearings everywhere
Simple and Instant Servicing

90 DAY GUARANTEE

See it—Compare it against any other truck!

Your Local Distributor Can Supply You

Sold and serviced in U.S.A. by

MADE IN ENGLAND BY OMIC LTD., LONDON

THE PALTIER CORP.

1701 Kentucky St., Michigan City, Indiana
(Distributors In Principal Cities)

IN CANADA
ELECTRO-HYDRAULICS LTD.
TORONTO, CANADA



Locomotive Crane Has High-Cab Design

This diesel-electric locomotive crane has a raised cab and controls that put the operator $17\frac{1}{2}$ feet above the tracks. Manufacturer says that this high-cab design gives safer operation and increased visibility. The crane will handle scrap and other material in steel mill operations. It has a special electric drive for the rotating mechanism. This feature eliminates standard clutches and gears and provides lower maintenance for heavy-duty applications. The ball race is of double-row, sealed design. It is 8 feet in diameter and is driven by an 86-inch internal gear. The crane has a 60-foot, two-piece boom, and will handle loads up to 65 tons. Maximum travel speed is 15 mph. It has power-positioned A-frame, air-controlled main hoist and boom hoist, and compartmented machinery deck.

Wellman Engineering Co.

Circle 201 on Reader Service Card



Platform Has Knee Brace

This material handling platform has formed-in knee braces to eliminate cracking and leg folding under heavy loads. There is a brace for every corrugation at the bend in the platform. It is said that the knee brace also gives the platform greater rigidity and ability to withstand shock.

Powell Pressed Steel Co. Circle 202 on Reader Service Card

Container for Granular Material

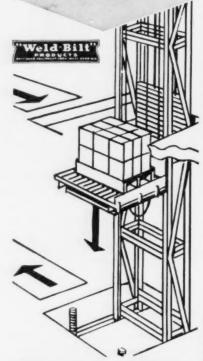
A cylindrical wirebound pallet box, the "Cylindri-Pak," is designed to handle, store, and ship free flowing granular bulk material. This container is made of tough, thin wooden sides bound with galvanized steel wires. Rigid plywood base is mounted on hardwood skids and equipped with a special steel channel rim. Manufacturer says that this cylindrical design resists the outward thrust of free flowing material, thus preventing bulging. The container gets stronger as it is filled, since the load presses outward and the wires contain the radial pressure. It is claimed that the container's ratio of tare weight to weight of contents is lower than any other in the field. For example, a 46-pound "Cylindri-Pak" is used for shipping 1200 pounds of resin.

General Box Co.

Circle 203 on Reader Service Card



NEW...for Floor-to-Floor Production Flow



Weld-Bilt VERTICAL TRANSPORTATION

Here's conveyor automation between floors - one, two, or three floor levels - with minimum remodelling. Automatic loading, unloading, lifting or lowering to match conveyor speed. Controls, brakes, switches, platforms - all engineered to your needs.

Write for profitable suggestions on your own floor-to-floor conveyorizing with Weld-Bilt "Vertical Transportation"

Send for Bulletin E-557

WEST BEND EQUIPMENT CORP.

MATERIALS HANDLING ENGINEERS

335 Water Street • West Bend, Wisconsin Circle 110 on Reader Service Card

NEW EQUIPMENT SECTION

Two-Way Radio for Walking Man

The "Handie-Talkie" pocket receiver and pocket transmitter were



designed for radio contact with the man on foot. The fully transistorized receiver (illustrated) picks up all radio signals on a system's frequency. The 46-ounce has

a 1-1/4 watt radio frequency output in the 25-54 Mc. band and 1.0 watt in the 144-174 Mc. band.

Motorola Inc., Communications and Industrial Electronics Div.

Circle 204 on Reader Service Card

Sets Up Boxes

A semi-automatic machine has been developed for setting up the Whalley one-piece beer box. Ac-



cording to the manufacturer, it can take a knocked-down-flat Whalley box and set it up completely in 5 seconds for an average output of 600 boxes an hour. Only one man

TERRIFIC PULLING POWE



THE NOLAN ONE MAN CAR DOOR OPENER opens or closes any freight car door in 20 seconds or less

The Nolan Model H One-Man Car Door Opener has been in successful use for many years, by thousands of companies who recognize its exclusive features of speed and safety. This popular tool enables one man to do by himself what formerly required the time and assistance of several men, usually taken off other jobs, to tug and yank while risking mangled hands, strained backs, and other serious injuries.

The average time required by one man to open or close a boxcar door with the Nolan Model H is 20 seconds or less. With a few quick pulls on the anchor chain, as shown here, you can get the most stubborn door rolling and wide open in a jiffy.

bere, you can get the most stubborn door rolling and wide op Your investment in a new Nolan Model H One-Man Car Door Opener will pay dividends by saving time, life and limbs throughout its long and useful life. It will keep men working steadily and safely without exposing them to the hazards present when make-shift methods are used to open car doors. Note above how operator is away from the front of the door operator is away from the front of the door ... away from its injurious, killing effects if the should fall!

Order one or more Nolan Model H Car Door Openers Today!

ONLY 100

F.O.B. Bowerston

NOLAN COMPANY 110 PENNSYLVANIA ST BOWERSTON, OHIO

Circle No. 82 on Reader Service Card for more information MATERIAL HANDLING ENGINEERING is needed to operate the unit, which is actually two separate machines connected by a conventional roller conveyor. When a box comes off the machine, the double bottom is glued, the lids formed, double-stitched and open, ready for the production line.

Gaylord Container Corp., Div. of Crown Zellerbach Corp.

Circle 205 on Reader Service Card

Truck for Limited Space

This fork lift truck has a capacity of 1,500 pounds on 18-inch



load center. It is a rider type, only 50 inches long and 30 inches wide. It is ideal for appliance or department stores, grocery warehouses, or any place where space is limited, says the manufacturer.

Lectro-Lift Co.

Circle 206 on Reader Service Card

Imprint Your Own Bags

You can imprint your own multiwall bags with a machine introduced by IME. Buy bags blank



from your supplier, and print any message on them in your plant. That eliminates the danger of bags becoming obsolete due to changes in advertising copy, and simplifies bag inventory. This machine prints 20 multiwall bags a minute. It's fully automatic, and can run intermittently or continuously. Bag size is adjustable.

Industrial Marking Equipment Co. Circle 207 on Reader Service Card

Aids in Plant Layout Planning

A complete line of charting materials simplifies planning for plant layout. It includes pressure sensitive tapes, templet, planning boards, rectangles, and other



items. These can be used as twodimensional scale models in table-

Keep Your Product on the Move



TV tubes emerge from a bake-out oven on a 12' wide Ashworth Bell

with ASHWORTH METAL PROCESS BELTS

Every industry has its problem of moving materials during processing. Fabricated from any metal capable of being formed into wire, Ashworth Belts provide a conveying medium permitting processing in transit through temperatures from -50° to 2100° F. Wherever your product must go during processing, be sure to get the "right" belt for the job . . . consult an Ashworth engineer.

Ashworth Metal Process Belts can help you effect economies . . . and keep your product on the move.

Illustrated literature available



ASHWORTH BROS., INC., WINCHESTER, VIRGINIA

SALES ENGINEERS: Atlanta, Baltimore, Boston, Buffalo, Charlotte, N. C., Chicago, Cleveland, Dallas, Detroit, Fall River, Mass., Greenville, S. C., Louisville, New York, Philadelphia, Pittsburgh, Rochester, St. Louis, St. Paul, Tampa, Canadian Rep., Peckover's Ltd., Toronto, Montreal.

Circle No. 16 on Reader Service Card for more information

NEW EQUIPMENT SECTION

top planning. Complete catalogs covering organizational charting, statistical charting, operation and process flow charting, plant layout and office layout are also available.

Labelon Tape Co., Inc. Circle 208 on Reader Service Card

Samples Available

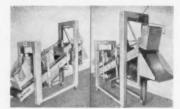
A Green Core pressure sensitive

sealing tape just introduced is versatile—has many uses. It comes 1", 2", or 3" wide, is weather resistant, and can be applied without dispensing equipment. The 2" width is approved for closure according to Rule #41 and Mil Spec PPP-T-0076. This tape adheres instantly; needs no rubbing down. Rolls are 360 feet long. A test sample is available to anyone interested.

Mid-State Gummed Tape Div.
Minnesota Mining & Mfg. Co.
Circle 209 on Reader Service Card

Puts Pounds to Work

Each case is its own sealing weight with the portable case sealer just introduced by Standard.



The unit first glues the top flaps of cases, then gently turns the case upside down so its own weight compresses the flaps as the glue dries. No compression units needed. The sealer is 3 feet wide, 9 feet long.

Standard Metal Products Co. Circle 210 on Reader Service Card

Printed Tapes

The Tape-Pen applies printed tape ($\frac{1}{4}$, $\frac{1}{8}$, 1/16, and 1/32 inch wide) following a straight edge,



French Curve, or freehand design. The tape eliminates drawing of broken, dotted, or solid lines in plant layout charts or maps. There are nine patterns and a variety of solid colors.

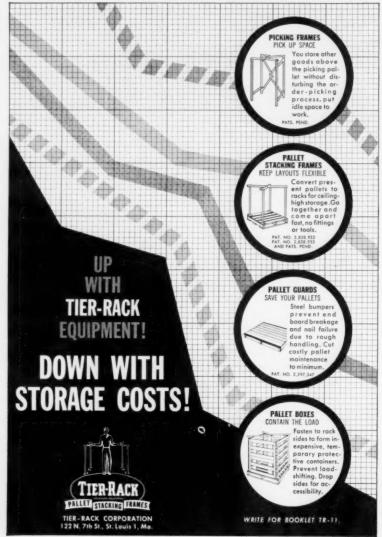
Chart-Pak Inc.
Circle 211 on Reader Service Card

Pressed Steel Caster

The Bond 51-A series pressed steel rigid truck caster is formed in one piece from heavy-gauge



steel. In addition, the units incorporate a deeply embossed base and double formed ribs on the



Circle No. 107 on Reader Service Card for more information

legs. A steel sleeve fits over the axle of the new series and is held rigidly between the fork members. This sleeve construction strengthens the caster and prevents wear on the axle by providing a larger axle bearing for the wheel.

Bond Foundry & Machine Co. Circle 212 on Reader Service Card

Circuit Conveyor

This indexing type circuit conveyor is used with type "L" and type "V" polishing and buffing head units on automatic installa-



tion. The conveyor is made sectional to permit future expansion or rearrangement and for ease in shipping. A complete conveyor would include a loading end section, a drive section, and a variable number of intermediate sections. Two strands of heavy duty roller chain running over double sprockets on vertical shafts in each conveyor end section provide the conveying medium.

Divine Brothers Co.
Circle 213 on Reader Service Card

Embossed Letters on Strapping

The Roovers Midgie labeler is a hand-operated tool that stamps raised letters on ½-inch straps. It



puts permanently embossed letters and numbers on corrosion-resistant monel, stainless steel, aluminum, copper, lead and vinyl plastic. You just dial the letter and squeeze the handle. In addition to stamping letters and numbers, the Midgie also punches holes.

Roovers-Lotsch Corp. Circle 214 on Reader Service Card

Bulk Handling for Everyone

Companies converting to bulk handling but are not located on a rail siding can use the Dense-Flo bulk trailer to cure handling headaches. It will blow any dry powdered or granular material through



pneumatic lines to storage bins hundreds of feet away. No mechanical conveyors or in-plant handling equipment needed. The trail-





2-cylinder Wisconsin Engine specified for Allis-Chalmers Chore Boy Platform Truck, Model CB20. When an original equipment manufacturer engineers a Wisconsin Engine into a product...manufacturer and user benefit. The manufacturer builds repeat sales and goodwill. The user gets long term power dependability and constant power delivery due to the rugged features found in Wisconsin Engines...unmatched in performance in the 3 to 56 hp, field.

Write for bulletin S-223 describing all single-cylinder, 2-cylinder and V-type 4-cylinder models. *Electric starting* equipment available on all engine models.

M e than 2,000 service stations... one or more near you.



Circle No. 111 on Reader Service Card for more information

Circle 120 on Reader Service Card



eliminates product damage



STEEL CAPS hold the deckboards like C-clamps

Ask Us How Using METALCAP Can Lower Costs in YOUR Plant

NEW YORK 122 East 42nd Street . CHICAGO 4754 W. Washington Bivd. * EStebrook 9-1712 BOSTON 110 High Street

NEW EQUIPMENT SECTION

er can unload 20 tons of material in an hour. Pneumatic blowing equipment is self-contained. Inplant handling costs are down because storage bins can be located at the point of use instead of near loading dock.

Albert Air Conveyor Corp. Circle 215 on Reader Service Card

Power Dock for Non-Level Areas

A recently introduced power dock is designed to compensate for out-of-level conditions. Model



#9000 power dock has no fin-

gers; the deck is not segmented or uneven. The ramp is solid front to back. It warps by special hinging mechanism, under the solid deck, plus and minus four inches from lateral level.

Hartman Metal Fabricators, Inc. Circle 216 on Reader Service Card

For Industrial Lighting

Three models of the Lirelab lighting units are available: the industrial high bay unit, the flood-



A modern truck for modern plants The Hydro Lectric

with most modern features

- 2 Drive Wheels instead of one
- 2 Braking Systems available instead of one
- 4 Wheel Stability instead of three
- Alloy Gear Transmission instead of chains
- 100% more Steering Ease -Greater Maneuverability
- 50% less Maintenance -Easy Accessibility
- Finger-Tip Control -Greater Safety



WRITE FOR BULLETIN KP

STUEBING Designed . Engineered . Built

TRUCKS, INC. / 2419 Spring Grove Ave., CINCINNATI 14, OHIO



THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL Circle No. 66 on Reader Service Card for more information



reduces handling costs



hold the deckboards like C-clamps

Ask Us How Using METALCAP Can Lower Costs in YOUR Plant

NEW YORK 122 East 42nd Street . CHICAGO 4754 W. Washington Bivd. . EStebrook 9-1712 BOSTON 110 High Street

Circle 121 on Reader Service Card MATERIAL HANDLING ENGINEERING light, and the industrial low bay unit. These lighting units feature hermetically sealed silver reflectors, positioned in the back for maximum lamp output. Manufacturer says that Lirelab will deliver the same light intensities with a standard 500 watt incandescent lamp as you now receive with a 1000 watt incandescent lamp.

Lighting Research Laboratories Circle 217 on Reader Service Card

Switch Strapping Sizes

You can switch from one strapping size to another with the Model 440 Bulkbinder Dial-A-Band



powerized electro-air band dispenser. It handles 34", 1-14" and 2" flat steel strapping. Just set two dials for the desired length and number of straps. The Bulkbinder does the rest. Use it to cut packaging costs for any kind of product or operation.

A. J. Gerrard & Co.
Circle 218 on Reader Service Card

Storage Racks Feature Flexibility

Three new models of Mini-Module stock storage racks provide flexibility in storage of rod, pipe,



sheet stock or other metal parts. The new models, identified as BS, CS and DS, enable the user to insert special shelves and/or 4-way dividers. Capacities range from 2500 lbs to 7500 lbs per unit de-

pending on size. Special nesting caps permit stacking in vertically interlocked tiers.

Jarke Manufacturing Co. Circle 219 on Reader Service Card

Dual Feed Unloader Works Twice As Fast

A portable transfer unit with a new dual feeder device empties Airslide cars in half the time of a single-feeder unit. The dual feeder has two airlocks, each of which is situated directly beneath outlets in the car. This feature eliminates need for the centrally-positioned Airslide brand of fluidizing con-



veyor which formerly delivered material to a single airlock from both outlets. Designed for handling flour and other materials with similar properties, the portable transfer is equipped with a



NEW EQUIPMENT SECTION

manifold which can be plugged in either end, making it possible to unload from each side of the car. There is no need for additional conveying hoses, as air connections for both sides of the car are an integral part of the equipment.

Fuller Co.

Circle 220 on Reader Service Card

Plate Glass Handled Safely

This hydraulically operated Power Loader lifts plate glass on and off a truck with ease and safe-



ty. This truck-mounted crane does both loading and unloading within a 360 degree radius of the truck. Remote control is available to permit one-man operation. The Power Loader crane for trucks can be used for many ware-housing and delivery applications. It has a load capacity of up to 4,000 pounds.

Daybrook Hydraulic Division, Young Spring & Wire Corp. Circle 221 on Reader Service Card

Crane Handles Rubber Tanks

This crane uses a special hook arrangement to handle large rub-



ber containers. This hook is closed by compressed air switched on by the operator. The hook opens when there is no load on it. The air line keeps the hook lined up straight under the boom, but the ring is so designed that it will pick up a bin even if the eye is at right angles to the boom.

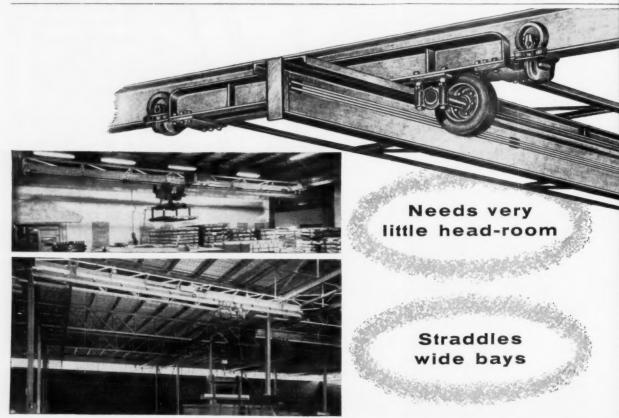
Grove Manufacturing Co.
Circle 222 on Reader Service Card

Trolley Has Low Clearance Dimensions

Low headroom, end approach and side clearance dimensions are featured in the Lo-Hed electric wire rope hoist. The four-wheel



motor driven trolley runs on special monorail track or standard

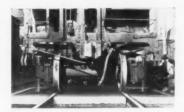


I-beam. It is available on all Class A, B, H and J signel speed, two speed or variable speed heavy duty hoists with lifting capacities ranging from one to fifteen tons. The unit operates on all volages and frequencies of ac or dc current with push-button control.

American Engineering Co. Circle 223 on Reader Service Card

Jack To Lift Railroad Cars

Jacking railroad cars off their trucks for "spot" system maintenance work in hump yards or on



rip tracks may be simplified by the recent development of a package jack arrangement. Cars requiring maintenance can be spotted directly over the recessed jacking equipment, and five-way controls position the car at desired height up to 60 inches.

Joyce-Cridland Co. Circle 224 on Reader Service Card

Controls Strapping Operations

Proximity Control Systems respond to the presence of any metallic mass in proximity to their pickup. They provide a means of controlling packaging operations as well as counting units being stored or shipped. For strapping operations, a power drive feeds the strapping to a guide chute located along the edges of the table. This chute positions the strapping completely around the container. An operator presses a button that actuates the mechanism to tension the strap around the container. The control head for this system includes a specially designed pickup

Electro Products Laboratories
Circle 225 on Reader Service Card

Circle 93 on Reader Service Card





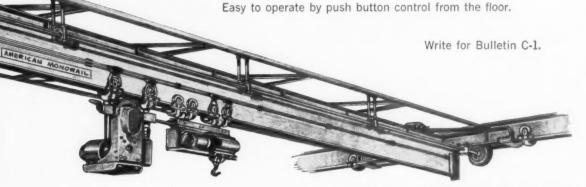


Tonnelle Ave., North Bergen, N. J

LONG SPAN CRANE

American Monorail's long span crane hugs the ceiling...lets you

handle loads up to 10-tons in a wide bay ... even under a low roof.



MEMBER OF MATERIAL

HANDLING INSTITUTE

AND MONORAIL

MANUFACTURERS ASSOCIATION

ENGINEERED MATERIALS HAND

13129 ATHENS AVENUE CLEVELAND 7, OHIO



MONORAIL

MERICAN

Circle No. 126 on Reader Service Card for more information

Free!

Booklets...cost saving ideas on packing, shipping, bulk handling

Four idea booklets, complete information, show how you can save cost in packing, handling, stacking, shipping and bulk handling.

- 1. "What To Expect From Wirebounds" describes construction and general
- "Materials Handling, Warehousing and Stacking" is a digest of moneysaving methods.
- "Heavy Loads" explains how extraheavy shipments handle easier in Wirebounds.
- 4. "Pallet Boxes" shows how to handle items in bulk safely, at low cost.

Write on your letterhead for the booklet or booklets that interest you!

WIREBOUND BOX MANUFACTURERS ASSOCIATION

Room 1462

222 West Adams Street, Chicago 6, III.

Wirebound









NEW EQUIPMENT SECTION

Twin Hoist Lifts Dump Body

The Twin Yard Bird is a lightweight dump body made specially for a one-ton truck chassis. Manufacturer says this 12 gauge steel body does away with costly half loads on



larger trucks. It has an 8-ton lift capacity, provided by a twin-head hydraulic hoist unit. Twin Yard Bird bodies are available in lengths of 8, 9, and 10 feet. All bodies are 78 inches wide.

Anthony Co.

Circle 226 on Reader Service Card

Creped Wadding Cushioning Combines Thickness, Economy

After four years of research, Super Crepe Kimpak is now available for industrial packaging. It's manufactured by a new process that gives more crepes in each ply,



combining thickness and economy. Super Crepe Kim-



DOWN



This is no ordinary trailer! It's Trailevator! Lowers to ground level . . . lifts load hydraulically in seconds . . . ready to roll! One man operates it . . . loads and unloads any cargo—anywhere—faster, safer, cheaper! Learn how Trailevator brings major cost-savings never before possible.

WRITE FOR BULLETIN T-58. Trailevator Division, Magline Inc., Pinconning, Michigan.

Traile VATOR

Circle 122 on Reader Service Card for more information IOR

A-B-C Short Case Sealer

floor space

saves

This A-B-C- Short Case Sealer really increases packaging efficiency. Glues, folds and seals either or both top and bottom flaps in one operation—automatically. Speeds up to 30 cases a minute. Finest welded construction. Ball bearing construction reduces maintenance. Guaranteed not to get out of "time."

whatever your packaging problem, there's a proved A-B-C machine to solve it—case sealers, unloaders and unscramblers, side sealers, hand gluers, case openers and case loaders.

WRITE TODAY FOR DETAILS
FLOOR PLANS & SPECS

A-B-C PACKAGING MACHINE CORP.

Circle 1 on Reader Service Card for more information

MATERIAL HANDLING ENGINEERING

pak comes in thicknesses from .04 to .50 inch, bleached or unbleached, in rolls or sheets, with a wide choice of backing. Like regular Kimpak, it's a creped cellulose cushioning material that's resilient, non-abrasive, odorless, dust-free, and highly absorbent. It conforms to any size or shape of product.

Kimberly-Clark Corp.
Circle 227 on Reader Service Card

Plastic-Steel Drum Holds Corrosives



The JALboy container has a polyethylene inner container and a steel drum outer jacket. It makes a low-price returnable container for liquids of all kinds, including corrosives. It comes in two sizes: standard weight 14-gallon (with 5-3/4-pound inner liner), and heavy duty 13-

gallon (with 8-34-pound inner liner). Weight and cubage are well below conventional carboys, and there is no danger of breakage. Side handle grips are available. Your company design can be printed on the side

Jones & Laughlin Steel Corp. Plax Corp.

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Circle 90 on Reader Service Card for more information DECEMBER. 1958

The MARTIN-DECKER Sensater Crane Scale

FRICTIONLESS OPERATION
GREATEST ACCURACY



EASY HANDLING—Light weight and Compact. Full 360° Hook Rotation permits swiveling in any direction.

MORE CONVENIENT—Manual Tare Adjustment zeros-out grabs, hooks, chains, tote boxes, etc. Minimum Headroom Loss.

EASY READING—Adjustable Gauge can be tilted up or down. Dual Range Dial provides accurate distant and close reading. Entire Dial Circumference Calibrated for precise readability.

SAFER — Five-to-one safety factor allows ample overload margin. LOWER IN COST — Averages lower in price than hook scales of comparable capacities.

1,000 to 20,000 lb. CAPACITIES.

FOR FURTHER INFORMATION WRITE TO MARTIN-DECKER CORPORATION

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MARTIN- DECKER CORP.

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109



Nothing of comparable value in low price field.

WRITE FOR BULLETIN 1058.

BEARING DIVISION

STEPHENS-ADAMSON MFG. CO.

36 RIDGEWAY AVENUE

AURORA, ILLINOIS

How to improve QUALITY CONTROL in your parts-handling operations

EEZY-STAK PARTS-HANDLING CONTAINERS SPEED PRODUCTION, PROTECT FINISHES, REDUCE REJECTS, CUT HANDLING COSTS!

Why risk damage to critical-finish, high-cost parts during intra-plant movement? Quality control begins with safe, dependable handling. From initial production through final assembly, you can depend on EEZY-STAK baskets to do a quality parts-handling job. Custom-designed to meet specific requirements, EEZY-STAK baskets protect against damage . . . speed production . . reduce rejects! Available in a wide range of wire diameters. Sturdy, all-welded construction. Zinc plated to resist rust and corrosion. Patented inter-lock handle for easy stacking. Safe, compact parts storage. (EEZY-STAK baskets also available for bulk parts handling.)

Write today for Bulletin No. B-54

WIRE & IRON PRODUCTS, INC.

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Circle 130 on Reader Service Card for more information



NEW EQUIPMENT SECTION

Mylar Stencils Custom Designed

Now you can buy stencils in clear Du-Pont Mylar polyester film. You can get them either with standard machine-cut characters, or with special designs cut by hand. Either .0075 or .010 thick.



They're flexible enough to conform to uneven surfaces and still give clean sharp results. Mylar won't tear or scratch, and is impervious to inks and chemicals.

Diagraph-Bradley Industries, Inc.

Circle 229 on Reader Service Card

Cradles and Storage Racks For Drums

Drum cradles for 55 and 30 gallon and smaller drums are available with and without casters, with and without drum rollers. Drum storage



racks hold 4 or 6 drums, and do not require anchoring



Circle 131 on Reader Service Card for more information

MATERIAL HANDLING ENGINEERING

to floor. Racks and cradles are called Grizzly. Cradles have 2 swivel and 2 rigid casters.

Pucel Enterprises, Inc.

Circle 230 on Reader Service Card

Conveyor Idler Series Added



Manufacturer of these conveyor idlers has added five series to the line, in widths ranging from 14 inches

to 84 inches. These idlers are designated as Series 5000 through 9000 and have a wide range of idler types. In addition to flat, 20-degree, and 45-degree troughed idlers, there are rubber cushion idlers for use at loading points, positive action and actuating disc training idlers, and variable trough idlers. All five of the idler series feature inverted angle bases.

Link Belt Co.

Circle 231 on Reader Service Card

Lift Gate Line Redesigned



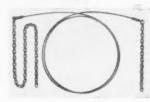
A lift gate line has been redesigned, says this manufacturer, to provide longer life and lower maintenance. These hydraulically operated gates allow the driver alone to load or unload a shipment

from his truck. Lift gate Models 145, 245, and 146, suited for trucks of 11/2 tons and heavier and semitrailers, will lift and lower loads of 2000, 3000, and 4000 lb. respectively. Semi-trailer installed lift gates can be powered by tractor engine or independently by a gasoline engine or electric motor.

Anthony Co.

Circle 232 on Reader Service Card

Chain and Cable Assembly Binds Logs

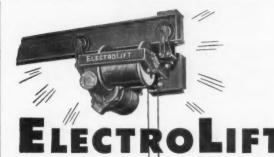


You can tighten and lash a load of logs with this combination chain and cable log binder. This unit consists of (1) a 3/8-inch, high carbon, high test chain, heat-treated for

high tensile strength and resistance to wear; (2) preformed plow-steel Green Strand cable in choice of 3/8, 7/16, and 1/2 inch diameters; and (3) Truc-Loc connectors, a cold swaged rope ending without loops or splices. Overall length of the log binders is 26 or 28 feet which includes 8 feet of chain in any combination.

> American Chain & Cable Co., Inc. Circle 233 on Reader Service Card

Circle 36 on Reader Service Card for more information



...for long-term unfailing performance

The ElectroLift worm-drive hoists—in capacities from 1/4 to 10 tons . . . compact design requiring minimum headroom ... superior braking power ... simplicity of operation—are noted for their productive and dependable long life. Consult your local ElectroLift representative, or write for a complete catalog.



5844

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Clifton, N. J.





These new accessories provide still

nest within their own dimensions,

cannot shatter, dent, or bend, and

Stack-n-Nest pans . . . the only molded fiberglass pans that stack and

are impervious to oil, water, and most chemicals. Write for complete

greater versatility to Lewis

PAN COVERS

- Molded of Fiberglass Reinforced Polyester in colors to match pans
 Snug fit keeps out dust
- "Contour offset" for safe, high stacking of covered and dirt
- · Nest deeply when not in
- Use as trays if desired Popular size*

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- 4-CASTER DOLLIES

 Molded of Fiberglass Reinforced Polyester in colors to match poons
 Four heavy-duty, easy-rolling swivel casters

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 Quick, easy multiple handling and movement loaded or empty
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- Popular size* * Fite the 22 x 14 x 8" and 27 x 16 x 11" Stack-

n-Nest pans. STACK-n-NEST PANS

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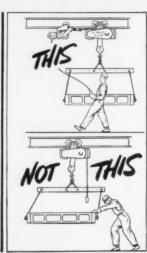
tances. Ask for Trojan

Tractor Bulletin 833

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Circle 9 on Reader Service Card for more information

NEW EQUIPMENT SECTION

Scoop Truck Handles Bulk and Scrap



This scoop truck is ideal for handling bulk and scrap materials in factories, storage plants, or foundries. To operate: Thrust nose into or under items to be moved. Press down handles and load bal-

ances on undercarriage. Wheels are center-balanced for easy moving; no weight on the operator. Nose width measures 28 inches, with overall length at 321/2 inches. Back depth is 8 inches, angle break is 11 inches, and nose break is 183/4 inches.

Lansing Company

Circle 234 on Reader Service Card

Roll On Stencil Ink



Here's a method of stenciling without brushes or sprays. The Rolmark kit allows you to stencil with a sponge-rubber roller.

Ink is applied neatly, through heavy or small stencils. The special alcohol-base ink comes in black or colors. and can be applied to metals as well as porous surfaces.

Marsh Stencil Machine Co.

Circle 235 on Reader Service Card

Solid Tire Gas Truck for Heavy Industry

Here is a line of heavy duty gas trucks for material handling in metals manufacturing and other heavy industry. These trucks are 15,000 to 20,000 pound capacity, have solid tires. They're



powered either by gasoline or LP-Gas. This truck line, called the G-5, features a nested channel assembly with an 11-inch outer section and a 9-inch inner section. The 15,000 pound model has a 112-inch turning radius, which is increased just one inch in the 20,000 pound model. Manufacturer says that all trucks in the G-5 line will maneuver with ease in and out of a standard railroad boxcar.

> Yale Materials Handling Div., The Yale & Towne Manufacturing Co.

Circle 236 on Reader Service Card

MATERIAL HANDLING ENGINEERING

SELECTION AND USE OF BELT CONVEYORS . . .

(Continued from page 68)

pared to he 0.30 of sliding belt conveyors) and their ability to carry a wide variety of package shapes and sizes in either direction or on an incline. Roller beds are recommended for medium to heavy service.

Belts

For horizontal systems a 28ounce 3-ply filled fabric belting is common. It resists moisture, has a smooth surface and slides easily, and doeesn't stretch much. It can be used on inclines up to 10 degrees. Plain canvas belts are often treated with wax to make them more durable. Other treatments enable them to resist temperature or liquids. Other belts commonly used on flat bed conveyors are made of fabric covered with rubber or plastic, glass cloth, or metal (sheets, woven wire, and flat wire).

The belt's width often depends on product size. Flat, firm bottomed items usually may overhang the belt considerably. A 6-inch overhang is not unusual for cartons. For bags, particularly loosely filled ones, the belt should be as wide as the bag and preferably a few inches wider to make loading easier. For barrels or drums on end, the belt should be 2 inches wider than the container. For drums on their sides, the belt can be considerably narrower than the drum, but guard rails are needed to keep the drums centered on the belt.

Rubber-covered belts can move loads up 15-degree slopes. Rough or patterned rubber-covered belts will move packages up steeper inclines. Some patterns are more effective with heavy loads, others for light. While rough surface rubber belts will move packages up 30 degree inclines, a 25 degree slope is a better maximum. A belt may still look good yet not be able to move packages up the incline it could when new.

Belts with integral flights will move material up even steeper inclines. Magnetic conveyors move ferrous materials up nearly any incline. These conveyors have mag-

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... is the cancer quack, the man who claims he has a "secret cure" for cancer. There is no "secret cure" for cancer. But many cancers can be cured if detected and treated in their early stages by a qualified physician.

See your doctor regularly. Give him the chance to give you the chance of a lifetime. Ask your local American Cancer Society office for a copy of its antiquack pamphlet, "I Have a Secret Cure for Cancer."

American Cancer Society





Circle 125 on Reader Service Card



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Write for catalog No. 66.

AJAX FLEXIBLE COUPLING CO. INC. WESTFIELD, N.Y.

SELECTION AND USE OF BELT CONVEYORS

Continued

nets mounted underneath a slider board and use a thin rough surfaced belt for added friction.

Metal Belts

Endless belts of cold rolled strip steel often enable you to process while you handle. They're ideal for handling sticky and plastic material. Food will not pick up an odor or taste from a stainless steel belt. You can scrape material from a metal belt without contaminating the material with belt scrapings. Strip steel belts will withstand heat and corrosion and have high heat transfer rates. These properties make them ideal for drying in transit material such as inorganic pigments, for cooling and solidifying resins and sulphur, for continuous curing of rubber, casting of foam rubber, baking cookies, and cooling chocolate. And steel belts are easy to clean with hot water or steam.

Because metal belts are smooth and have little friction, they're fine for handling material which at times has to be held against a stop while the belt slides underneath. Examples: Metal cans on filling or packaging lines, machine parts between operations.

Woven and flat wire belts are often used for moving parts through washing and heating or cooling operations.

Look to hinged steel belting for heavy duty. You can run it in tanks of water, acid, or oil. It can handle rubber pellets, plastic parts (some plastics are very abrasive), and metal parts, scrap, and turnings. Sharp-edged metal parts can slide on top of the belting or be deflected from it.

Photographs and information courtesy of The Alvey-Ferguson Co.; The E. W. Buschman Co.; J. D. Christian-Engineers; Conveyor Specialty Co., Inc.; Conveyor Systems, Inc.; J. C. Corrigan Co., Inc. Harry J. Ferguson Co.; B. F. Goodrich Co.; Hewitt-Robins Inc.; Hytrol Conveyor Company, Inc. Island Equipment Corp.; Joy Manufacturing Co.; Lamson Corp.; Link-Belt Co.; May-Fran Engineering, Inc.; Pettibone New York Corp., Division of Pettibone Mulliken Corp.; The Rapids-Standard Company, Inc.; Sandvik Steel, Inc.; Standard Conveyor Co. and Conveyor Equipment Manufacturers Association



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Any man in your maintenance or warehouse departments can build sturdy racks with only a hex key and a hacksaw, using new or used pipe in standard I.P.S. pipe sizes. Completely flexible . . . adjust to meet changing requirements. 100% pipe salvage.

The Hollaender Manufacturing Company

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MATERIAL HANDLING ENGINEERING

SPHE COMPETITION . . .

(Continued from page 86)

Co., Aero Division, Minneapolis, Minn. A corrugated box with telescoping sleeves and polyurethane foam end pads, for delicate electronic fuel gages.

3rd prize: John S. Renner, Admiral Corp., Chicago, Ill. A corrugated box for table model clock radios.

Group II—Nailed wooden boxes and crates

1st prize: Henry H. Kelly, Westinghouse Electric Corp., East Pittsburgh, Pa. A wooden box with excelsior inner pack, for Ignitron tubes. Dimensions: 22" x 22" x 38". Shipping weight: 127 pounds. Replaces heavier, totally-enclosed wooden box. Cuts material costs 40 percent, labor 50 percent, transportation 40 percent.

No other winners in Group II.

Group III—Wirebound boxes and crates.

1st prize: W. J. Maxwell, Pitts-

burgh Plate Glass Co., Creighton, Pa. 2-layer box for automobile windshields. It has a 4-way entry pallet base, 34 mat (end-backend), two separate front sections or gates, an intermediate shelf, and a top. Dimensions: 43" x 581½" x 671½". Shipping weight: 2,425 pounds. Replaces similar single-layer box. Cuts labor and material costs 50 percent, tare weight 39 percent.

2nd prize: Bernard A. Weber, General Electric Co., X-Ray Department, Milwaukee, Wis. The package is a wirebound box for X-Ray generating controls.

3rd prize: Earl Tolson and Marvin Koth, K. O. Lee Co., Aberdeen, S. Dakota. A wirebound box for grinding fixture attachments.

Group IV—Cleated panel boxes.

1st prize: Richard E. Grossman, Wilmot Castle Co., Rochester, N. Y. Designed to accomodate a complete series of 12 types of bedpan washing units. Dimensions: 23" x 22" x 63". Shipping weight: 300 pounds. Cuts material costs

40 percent, labor 80 percent, cube 40 percent. No other winners in Group IV.

Group V-General.

1st prize: C. D. Forbes, Macklanburg-Duncan Co., Oklahoma City, Okla, A long box of heatformed paper-overlaid veneer, for lengths of metal building specialties such as weather stripping, mouldings and trim, sliding door tracks, etc. Consists of telescoping sections. Dimensions: varied; entry was 43/4" x 41/2" x 12'2". Shipping weight: varied; entry was 60 pounds. Material and labor costs cut 50 percent; transportation 67 percent. Box is easily opened by customers and is often used as stockroom bin.

2nd prize: Vincent J. Pachiano, Autonetics, Downey, Calif. Designed for export of extremely delicate gyros. It consists of inner carton with polyester foam blocking, and spring suspension box for overpack.

No other winners in Group V.

(Continued on next page)

M BRIDGES THE LOADING GAP...



MLM Dock Boards are LIGHTER . . . SAFER . . . STRONGER . . . BETTER BUILT

- Self adjusting for varying height of dock and truck bed.
- Exclusive Handholds formed with siderails. NO CASTINGS! NO WELDS!
- Safety-tread surfaces for maximum traction . . . minimum accidents.

LET MLM IMPROVE YOUR MATERIALS HANDLING REQUIREMENTS

Dock Boards • Yard Ramps • Lightweight Dollies • Pallet Dollies

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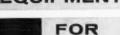
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BE SURE —
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TRAIN TRAILERS
Models and couplers
for rider type, remote
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LANSING, MICHIGAN

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84



MET-L-ITE ALUMINUM DOCK BOARDS are engineered to your dock requirements. All materials and workmanship guaranteed one year.

- Longer Life
- Greater Economy
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- Newest Aircomatic Welding Techniques

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Exclusive Dealerships in Selected Areas
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1701 Kentucky St. • Michigan City, Ind.

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SPHE COMPETITION

Continued

Group VI—Export Containers
No contest.

Group VII—Military packaging.

1st prize (BEST OF SHOW AWARD): Theodore Nicholson, Curtiss-Wright Corp., Wright Aero Division, Wood-Ridge, N. J. A fibre drum with laminated die cut corrugated pads, for shipping aircraft engine crankshafts overseas. Dimensions: 21" diam x 40" high. Shipping weight: 275 pounds. Replaces wooden box. Cuts material costs 55 percent, labor 82 percent, transportation 28 percent, cube 40 percent. The same pack is used for both military and commercial customers, domestic or export.

2nd prize: R. D. D'Andrea, Radio Corporation of America, Camden, N. J. A reusable aluminum shipping container for military supplies.

3rd prize: N. V. Sutherland, Raytheon Mfg. Co., Waltham, Mass. A magnetically shielded wooden box for Magnetron tubes.

Material Handling

All material handling entries were grouped into a single category for judging.

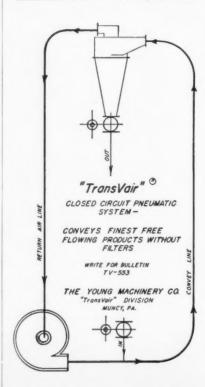
1st prize: G. W. Norton, General Electric Co., Appliance Park, Louisville, Ky. Rolled corrugated posts are used for blocking out 8 to 18" center voids in carloads of appliances. Replaces lumber bracing. Cuts material costs 20 percent, labor and time 90 percent. Allows 10 more carloads to be shipped daily with some personnel.

2nd prize: Carl F. Sprague, Miniature Lamp Department, General Electric Co., Nela Park, Cleveland, Ohio. A palletizing system for handling corrugated cartons containing sealed beam headlamps.

3rd prize: George G. Swenson, Jr., Minneapolis-Honeywell Regulator Co., Aero Division, Minneapolis, Minn. A contamination-free anodized aluminum container with clear vinyl cover, for shipping delicate parts.



8739 Tonnelle Ave., North Bergen, N. J.



Circle 114 on Reader Service Card
MATERIAL HANDLING ENGINEERING

GASOLINE OR LP-GAS . . .

(Continued from page 63)

parative values of potential power output, based on gasoline equalling 100 percent.

Acetylene	105.1 percen
Gasoline	100
Propane	97.6
Butane	97.3
Methane	85.8
Carbon Moxoxide	79.6
Hydrogen	68.5

If the heat input to the manifold is not controlled but remains equal for both gasoline and propane, the mixture temperature should be approximately 31 degrees F., lower with gasoline because sensible heat is taken from the mixture to supply the latent heat of vaporization. This is true only if the gasoline is completely vaporized. At a mixture temperature of 160 degrees F., with gasoline completely vaporized, if the manifold heat is not reduced, the calculated 31 degree F. mixture temperature rise with propane will result in mixture temperature of 191 degrees F. and a 4.9 percent decrease in power.

Economy

In a particular engine, if mixture distribution is perfect, the brake thermal efficiency at a given percentage of theoretical air is determined largely by the composition of the product of combustion. This is because of the relatively large difference between the heats of dissociation and variable molal specific heats of carbon dioxide and water vapor at the combustion temperatures.

You get more water in combustion when you use propane instead of gasoline. However, the smaller amount of carbon dioxide (Item 5, Figure 2) decreases the loss of heat due to dissociation. At the same time it increases the volumetric specific heat of combustion products slightly. Theoretically the thermal efficiency should be slightly higher with propane than with gasoline for these reasons. However, because of the small differences involved, the efficiencies may be considered substantially equal.

If the gasoline is not completely vaporized and if the intake manifold is poorly designed for using a liquid fuel, Item 6, Figure 2, will affect the economy to a limited extent. In such cases, the increase in economy with propane (due to better distribution) may amount to as much as 10 percent.

If the gasoline carburetor is poorly designed, you don't get an adequate acceleration charge; as a result the mixture must be extrarich at all times to give you satisfactory acceleration. In this kind of situation you can save as much as 18 percent more fuel by using propane.

Propane, with its high octane value (115+), will stand an increase in compression ratio of 2½ to 3 over gasoline in most engines. Figure 3 shows the gain that may be expected when compression is raised, using the proper manifold and correct spark curve. Note that both power and economy are improved.

Dynameter Test Results

Dynameter tests showed that increasing the compression ratio from 6:1 to 8.75:1 made a gain in maximum power of 17%. It also decreased fuel consumption 25%.

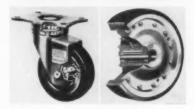
However, Figure 3 does not show that high compression gives you a cooler running engine and lower exhaust temperatures. The reason is that more heat units do useful work instead of being dissipated. Figure 4 shows the difference in heat balance between a 6:1 compression ratio and a 10:1

Compression rate is influenced by the following variables:

- 1. Engine design
- 2. Cylinder bore
- 3. Type of metal from which engine is made
 - 4. Engine speed
- 5. Carbonization, rusting, and
 - 6. Jacket temperature
 - 7. Mixture ratio
 - 8. Mixture temperature
 - 9. Volumetric efficiency
 - 10. Ignition timing

Figure 5 shows a comparison of the air-fuel ratio curves between gasoline and propane over the opYou'll benefit by big advantages

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RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.



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LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gun lubrication.



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write Greer Hydraulics, Inc., Jamaica 30, New York

GASOLINE OR LP-GAS

Continued

erating range of a highway vehicle. The gain in economy with propane at idle should be apparent. Due to poor distribution. especially at idle, gasoline requires an extra rich mixture. Gasoline is heterogeneous, propane is homogeneous. That is, you get the right mixture to every cylinder with propane; with gasoline, some cylinders run rich and some lean. The gasoline mixture must be rich enough to compensate for this. In Figure 5 the propane curve is somewhat ideal; however, there is one propane system that is approaching ideal specific fuel consumption curves throughout the full throttle and part throttle ranges.

Mixture Temperature

With gasoline, the temperature of the inlet mixture must be relatively high to keep a large proportion of the fuel vaporized. Disadvantage is that this heated mixture has already been partially expanded before entering the cylinder at lower pressures, thus losing pow . With propane it is not necessary to heat the inlet mixtures because it is a dry gas and should be kept cool. (Remember that power depends on the pounds of correct air-fuel mixture burned in the cylinder. So the more pounds of this vapor you can crowd in, the more power you get. Volume for volume, the cooler the mixture, the more it weighs and the greater its heat content and power.)

Volumetric Efficiency

Volumetric efficiency concerns the ability of the engine to breathe (the amount of air and fuel that will be drawn into the cylinder, compared to total displacement). Figure 6 shows the effect that engine speed has on volumetric efficiency. Its drop-off at high speeds results in torque drop-off. Peak torque occurs when combustion pressures inside the cylinder are highest,

Ignition and Timing

As you increase the compression

rate of an engine, the timing becomes very critical. A few degrees plus or minus can change the power output (and economies) as much as 2 or 3 percent. Since the ignition temperature of propane is about 40 percent higher than gasoline, it needs a higher potential or heat at the spark plugs to ignite.

Figure 7 shows the effects of late timing, correct timing, and early timing for a specific engine and fuel. The results will be practically the same from most engines and fuels. Fuel must be ignited at a point at which the entire charge will be burning (complete combustion), thereby delivering maximum pressures at top dead center on the power stroke.

The variables in ignition are: fuel, mixture ratio, inlet mixture temperature, range of rpm of engine, together with manifold depression. Octane number in a fuel does not indicate the sensitivity of a fuel to changing engine conditions. Each hydrocarbon compound has its own peculiarities and responds differently to changes in engine operation-critical compression ratio, engine rpm, and engine temperature. For example, Butane (C₄H₁₀) has a spark tolerance curve similar to gasoline in that the spark can be advanced with increasing engine rpm. Propane is only one step removed from gasoline in chemical and physical specifications, but its reaction during combustion is quite different. Ignition temperature is higher, flame travel is slower at the beginning: however, the flame speed acceleration seems to be higher per second than gasoline. In engine tests this is borne out by the flat advance curve with propane, compared to a steeper curve with gasoline.

To obtain maximum results with propane it is necessary to have a spark advance curve to allow for this different rate of burning. Unless your distributor is revamped to allow for the different burning characteristics of propane and gasoline, you should set the propane timing for low speed slightly late, so that at high speeds the spark advance will be about correct.



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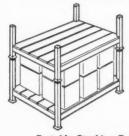
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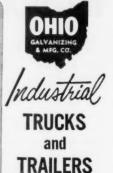
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